ENGINEERING NEWS-RECORD

JUNE 27, 1957

PRICE 50 CENTS

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In Bay Village, Ohio—Cuyahoga County Engineers combat corrosion with over 37 tons of wrought iron plate for 48-inch sewage line

Corrosive threat plus inaccessible location added up to Wrought Iron for 48″ O.D. sewage line

There was no question about the corrosion factors involved in the sewage line planned to serve Bay Village, Ohio. Compounding the problem was an almost inaccessible location that would make repair and maintenance difficult and expensive. And added to these considerations was the need for a material with sufficient structural strength to permit a 60-foot span between two trusses on either side of the valley the line had to cross. Cuyahoga County Sanitary Engineers, under the direction of Mr. John Puzenski, answered all these requirements with wrought iron. More than 37 tons of ½-inch wrought iron plate was fabricated into 48-inch diameter pipe and installed in approximately 270 feet of the sewage system.

Morgan Steel Products, Inc., Cleveland, Ohio, handled the fabrication. Installation work was done by The Utilities Construction Company, Cleveland, Ohio.

Our bulletin, *Wrought Iron for Sewage Treatment and Disposal Installations*, gives complete details on wrought iron's ability to last longer, at lower cost per year. Write for your copy.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Division Offices in Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. International Division: New York, N. Y.

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B Multiple plies of heavy fabric as load carriers of high capacity
C Skim coat of rubber for added flex-life

Served twice as long on rugged rock-pile job

Lifting 8-inch rock—at 350 tons an hour—up 125 feet to the crusher-mouth proved a belt-breaking job at this California quarry. Under the great weight, previous belts soon stretched beyond use. All failed in less than 4 years.

Then the G.T.M. – Goodyear Technical Man – made a recommendation: high-tensile-strength Style B Belt, constructed to resist abrasion and stretch under heavy loads. His belt lasted *twice* as long as its predecessor—with far less time out for adjustment. Its great success prompted the replacement of every other belt in the plant with Goodyear belts.

And that's only one of many problems where the G.T.M.'s solution has been a big time- and money-saver. To tap this knowledge and experience for *your* business, contact him through your Goodyear Distributor or write:

Goodyear, Industrial Products Division,
Akron 16, Ohio

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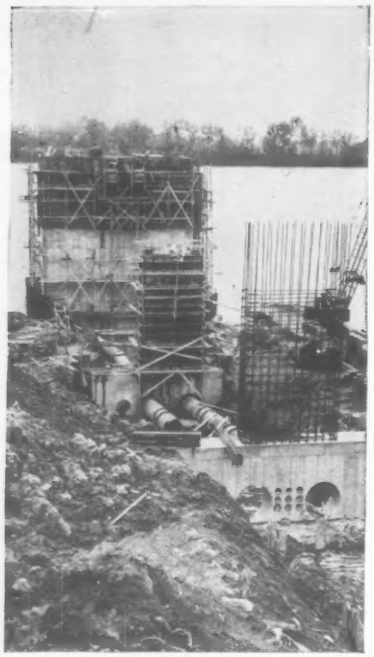
Symons FIELD REPORT...



Symons Forms used on Ohio River Intake Job...

60,000 square feet of concrete forming went into this job constructed for the city of Henderson, Kentucky. The wall started at elevation 317 (sea level elevation) or 21 feet below the river pool stage and when completed was topped at 385 or 47 feet above the water.

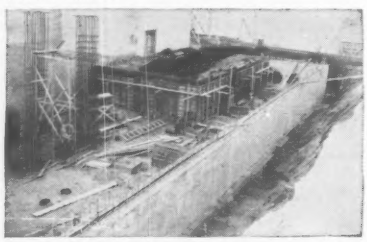
15,000 square feet of Standard Symons Wood Frame Forms were used, in sizes 2′ x 4′, 2′ x 6′ and 2′ x 8′.

George Ryan, Vice President said, "Even in the eight foot lengths our Symons Forms are easily carried by one man. Another feature which we have found helpful is the ease of removing a panel at any place in a wall to clean keyways and straighten reinforcing steel. This has saved us a lot of time."

Three piers for an all access bridge to the intake structure were also formed with Symons Forms. Part of the project involved an extension of the Henderson power plant.

Symons Forms can be rented with purchase option, all rentals to apply on purchase price. Symons Clamp & Mfg. Co., 4265 Diversey Avenue, Dept. F-7, Chicago 39, Illinois.

Roy Ryan Sons Company, Inc., Evansville, Indiana
General Contractor



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EIGHTY-THIRD YEAR OF PUBLICATION

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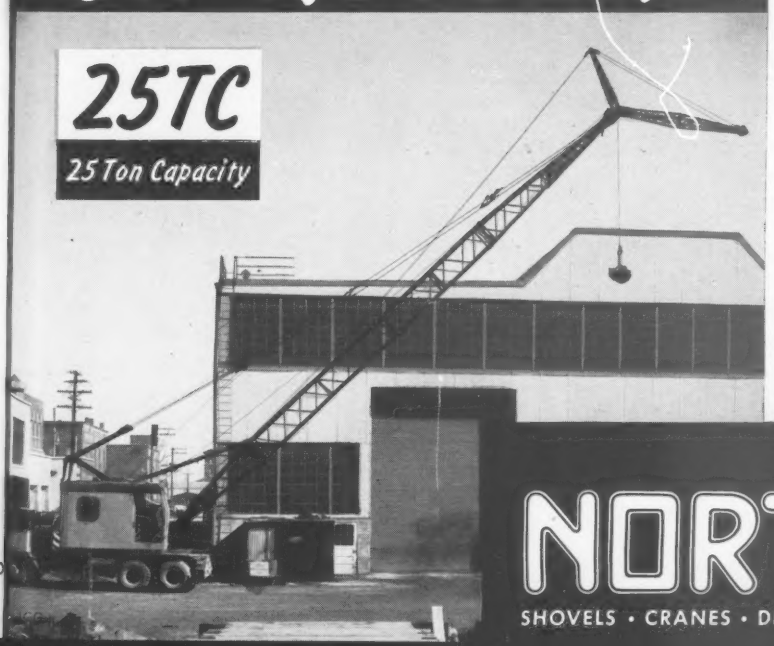
YOUR CHOICE ON RUBBER!



ALL truck cranes are not alike! Don't buy a truck crane without comparing the advantages Northwest brings you.

Look at the booms—the greater strength is obvious. Pivoted gantries are easily raised and lowered for clearance. Removable counterweight makes the reduction of gross weight a matter of minutes. Independent High Speed Boom Hoists are power controlled in both directions and operate independently of any other machine function and without sacrificing either of the main hoist drums.

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Lastly, remember Northwest carriers are not to be confused with carriers supplied for any other crane. They are Northwest designed—built to Northwest specifications with advantages found in no other crane carrier.

A Northwest man will be glad to give you full details—remember two sizes to select from—25-ton and 35-ton capacity. Get the whole story before you buy.

NORTHWEST ENGINEERING COMPANY

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THE NEW DAVIS BACK-HOE

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THAT COULD HANDLE THE JOB... RIGHT

Ditches at the base of a steep slope can be mean digging – but they are all in a day's work for the new Davis 210 Back-hoe. This unique equipment is the only machine in the world – outside of a man with a shovel – that can dig flush – that is, right next to a wall, building, or at the base of a steep slope where a tractor can't sit level. An **exclusive** rotary hydraulic boom swing cylinder along with three interchangeable mounting points on the frame make it all possible. This permits you to dig directly from behind either tractor wheel... or from the center... and it gives you 200° continuous arc with smooth starts and cushioned stops. Add all the other features of Davis – such as 7,000 pounds of breakaway, vertical design, independently controlled hydraulic stabilizers... five-minute detachability – and you can readily see why you will make more money and do the job faster when you have a Davis! Back-hoe is available truck mounted.

You'll recognize this other profit-maker – the Davis Loader – on construction and maintenance jobs where the owner has an eye for quality and demands equipment that will stand the test of time. It's America's premium loader at down-to-earth prices!

Davis Loaders and Back-hoes are available for all popular tractors and are sold and serviced throughout the U. S. A. by better dealers.

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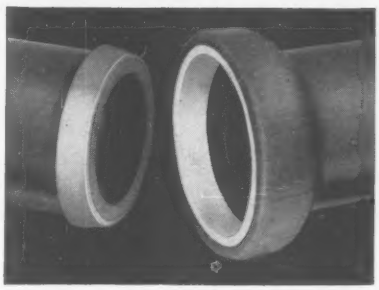


More than 200 major installations have been completed with outstanding results since Amvit Jointed Clay Pipe was introduced in 1955.

Such pioneer cities as Ann Arbor, Michigan, Dayton, Ohio, Camden, New Jersey have installed their second and third Amvit sanitary lines.

A mechanical joint designed for quick, low-cost installation, Amvit* will give you lower cost-in-place. Here's how:

1. QUICK INSTALLATION SAVES LABOR

No other materials such as caulking, joint compound, hot pots, or ladles are needed to make the Amvit joint. The joint is on the pipe delivered to the job ready for use. Just push the pipe together and the joint is complete.

2. IMMEDIATE BACKFILLING

You can backfill as soon as the line is completed. Barricades can be removed and streets opened days sooner.

3. QUICK TESTING

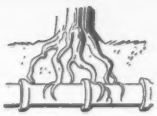
No need to wait days to see if a line has passed test. A look at the completed joint will tell. Thus, engineers can inspect and accept the line allowing the contractor to receive payment quicker.

4. CONTROLS INFILTRATION

Field tests from completed installations show that infiltration can be definitely controlled. Engineers can, thus, reduce infiltration specifications, use smaller diameter pipe and save in material cost.

5. ROOT PROOF

Amvit is a compression joint on the ball and socket principle. The surfaces of both bell and spigot are in uniform compression preventing root penetration.



6. BETTER FLOW, LESS MAINTENANCE

The design of the joint assures that the pipe is self-centered at all times. This gives perfect alignment and self-cleansing. Because the joint is really tight, no foreign matter such as dirt, sand and stones can possibly enter the line.

7. COMPLETE FITTINGS

Amvit is furnished on all standard fittings, as well as pipe. This will permit a uniformly tight line from house wall to treatment plant.

Amvit Jointed Clay Pipe, in sizes 4" through 24" together with all fittings is available for immediate delivery in the Northeast and Central States.

For more information on how Amvit can help cut your sewer project costs, write or call American Vitrified Products Company, National City Bank Building, Cleveland, Ohio, or our office nearest you.

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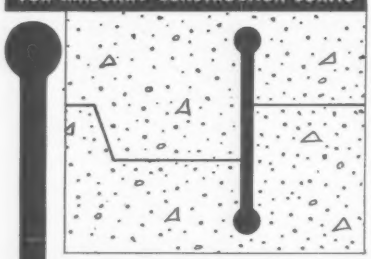


Williams Efficiency Waterstops are made from Natural Rubber Stock, and designed for maximum effectiveness in any type of cast-in-place construction joint. They will bend around corners—will not tear from shear action. Tensile Test: 3990 lbs.; Elongation Test: 650%. Available in rolls up to 80 feet in length. Field splicing is simple. Williams Waterstops can also be furnished in Neoprene for industrial uses where resistance to oil and other injurious wastes is desirable. These highly effective Waterstops are now in use in hundreds of industrial plants, commercial and public buildings throughout the country.

See Sweet's, or Write for Information.

WILLIAMS EQUIPMENT and SUPPLY CO.

6001 E. McNichols Rd., Detroit 12, Mich.

Reader Comment

Private vs Public Power

SIR:—In the Reader Comment department of your issue of May 16, Samuel Schiffer referred to the report of the Task Force on Water Resources and Power of the second Commission of Organization of the Executive Branch of the Government. (Hoover Commission) and to the matter of power generation by the Jones & Laughlin Steel Corp.

Mr. Schiffer states that Congressman Chet Holifield in his dissent and separate statement on the Commission's report "after considering all factors—including lost taxes . . . showed . . . that publicly generated power sells profitably below the level of private power." Apparently the writer is referring to Mr. Holifield's own rearrangement of figures taken from the Commission's report. That rearrangement clearly *excludes* the amounts of computed taxes contained in the Task Force's estimate of financial requirements of the various federal power systems. Even the rearranged figures show that neither the Southwestern Power Administration nor the Southeastern Power Administration obtained total revenues adequate to meet financial requirements *exclusive* of a tax equivalent. The same situation has existed in other systems, particularly in recent years, but this fact is obscured in the rearrangement of the figures.

A short letter such as this is no place to try to repeat the computations and findings of the Task Force. However, no qualified engineer would have difficulty in following in detail the report of the Task Group A on "Power Generation and Distribution" (a sub-group of the Task Force) and its documentation which apparently was overlooked in the rearrangement of figures included in Mr. Holifield's statement. The report is available from the Government Printing Office.

The assumption of the impact of subsidized power rates upon those applicable to investor-financed utilities reflects an error not uncommon in the handling of statistics. The conclusion is based on the assumption that since certain conditions could have led to the observed situation, then those conditions must have existed. In the cited conclusion no account is taken of the control exercised by federal and state regulatory bodies, the impact of improved technology and new inventions, or the competition between electricity and other sources of energy.

Mr. Schiffer referred finally to the generation of electric energy by large industrial power consumers. The average monthly purchase of electric energy by the Jones & Laughlin Steel Corp., for the first quarter of 1957 from investor-financed utilities, amounted to 55.21% of its energy needs as compared to 44.79% met by its own generation. Eighty-one per cent of the energy developed at the plant generators was by use of byproduct blast furnace gas, and the fuel used to develop a large part of the remainder was byproduct boiler coal incident to the production of metallurgical coal. These byproducts would have been largely wasted were they not used for the generation of electricity.

BEN MOREELL
Chairman of the Board
Jones & Laughlin Steel Corp.
Pittsburgh, Pa.

Estimating Is for Pros

SIR—Your article "Pro and Con on Merits of the Architect-Engineer" (ENR May 23, p. 42), left out a very important service that architects-engineers working for the government are usually asked to perform; namely, the preparation of construction cost estimates.

It has been our experience that most of them regard estimating as a necessary evil, treating it with disdain and trying to expedite it with a minimum of expense. Also, they usually do not have qualified personnel, with knowledge of current market costs of labor and material.

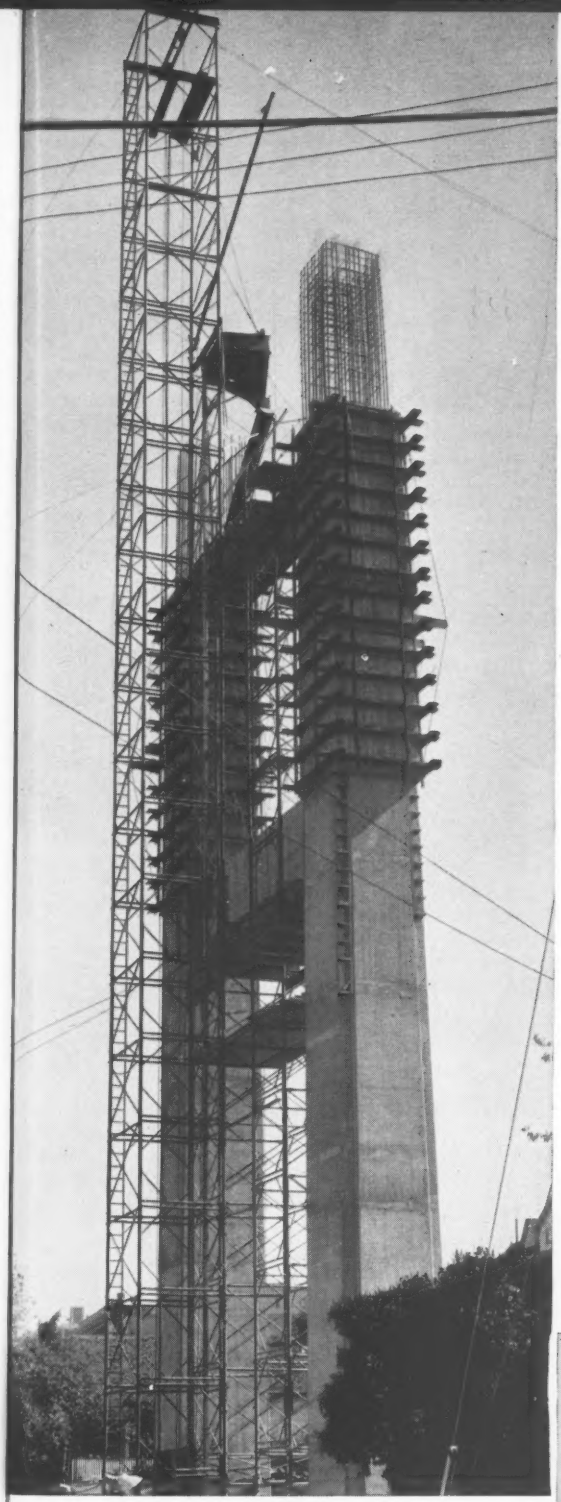
The situation is unfortunate, especially when government work is involved, because work planned often fails to reach the construction stage. Two of the main reasons are:

1. The original budget estimate is so high that the project is abandoned.
2. The final budget estimate is so far below the lowest bidder that bids are rejected.

In many areas this situation has become so critical that the estimating is given to professional estimating firms. And when the designer retains the estimating in his contract, he is frequently

Engineering News-Record welcomes expression of opinion from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance.

Letters should be addressed: Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.



CONCRETE GOES UP 130-FOOT TOWER TO SPEED PIER PROJECT

To perform what is regarded as one of the cleanest, fastest bridge jobs of its type, Morrison-Knudsen, has employed a unique concrete handling method on piers ranging up to 107 feet high!

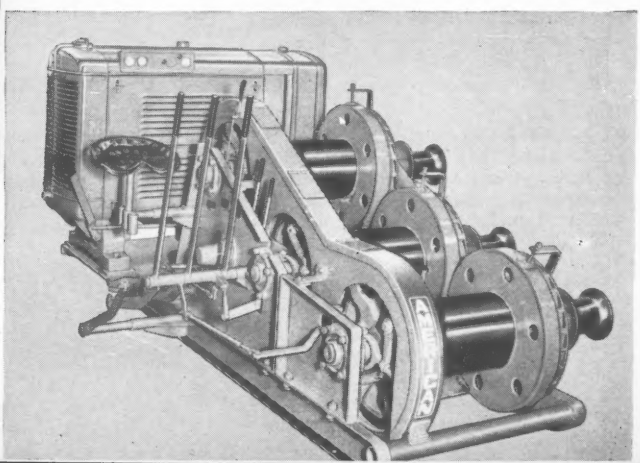
By using a 130-ft tower and a 1-yard rollover bucket, concrete is delivered quickly to the working level. Struts, with forms supported by heavy duty tubular steel scaffolding, are poured as an integral part of the pier.

Two American 2-drum General Purpose Hoists are used by the contractor. This 13-pier project will span the Spokane River at Spokane, Washington.

Because there's a rugged, reliable American Hoist to fit every lifting job, they're first choice of leading contractors from coast to coast. Versatile American General Purpose Hoists provide 3,000 to 12,000 pound single line pull capacities. American Iron Workers' Special Hoists—a complete line of specially designed hoists that meet the strict requirements of steel erectors—offer capacities up to 25,000 pounds SLP. For really big lifts, American Air Controlled Hoists, using steam, gasoline, diesel or electric power, deliver tremendous lifting capacity—as much as 60,000 pounds SLP are available in this line!

For 75 years American Hoist has specialized in designing and manufacturing dependable lifting equipment. You choose the top ranked line when you buy American. See your distributor for facts on these hoists!

Available with 2 or 3 drums and swingers, American's big 90-B General Purpose Hoist has a capacity of 9,000 pounds single line pull. An outstanding lineup of features is offered by this rugged hoist including: anti-friction self-aligning ball bearings; silent chain drive; machined gear teeth; balanced, interchangeable drums easily adjustable, reversible clutch and brake bands.



AMERICAN HOIST
and Derrick Company
1882-1957 **75** *years of service*
St. Paul 7, Minnesota

"HOT" WIRES... BUT NO FIRES

How dangerous are "short circuits" in an electrified floor system? Granco tested E-R Cofar to find out. Here's the story:

In electrified floor systems, wires are carried through hollow steel cells. But what happens when wires "short out"? It can cause a chain reaction of electrical destruction that burns out wires, ruins equipment, injures people.

But it *won't* happen in E-R Cofar floor systems! E-R Cofar has excellent electrical continuity that prevents build-up of dangerous voltage. To prove it, Granco engineers set up the test (above) in which a constant current of 30 amps (through four 1000-watt bulbs) was pushed through the E-R Cofar units. A calibrated oscilloscope measured the high electrical continuity of E-R Cofar by charting the comparatively low voltage drop as current passed through the units.

Like to see results of this test? . . . see the reason why firesafe E-R Cofar is listed in the Underwriters' Laboratories Electrical Construction Materials list? Simply drop us a card. This Electrical Continuity Test is another example of continuing Granco research that speeds better products to you.

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requested to subcontract this phase of the work to a professional estimating service.

SEYMOUR BERGER
Builders Estimating Service, Inc.
New York, N. Y.

Failures at Inflection Points

SIR—I have read the thoughts expressed in the many letters published in ENR over the last year or more, arising out of the shear failures of reinforced concrete beams near points of contraflexure.

Surely, to avoid this type of failure it is only necessary for it to be appreciated that the shrinkage stress of fully restrained concrete can practically reach the tensile strength, leaving little to resist shear. This is what I think Mr. Cheskin said (ENR Nov. 22, 1956, p. 6). Also, the free shrinkage strain is greater for wet mixes and for finely ground cement. Concreting continuous beams in one uninterrupted pour is an aggravation if the columns are stiff and may necessitate ignoring the ability of the concrete to take shear stress.

Unfortunately, there is little appreciation that laboratory tests of concrete members in shear are not often applicable to those same members when part of a large "monolithic" structure.

The writer knows of similar shear failures, but believes from personal experience that interrupted concreting, low water-cement ration and no omission of stirrups are the main clues to avoiding them.

Although post-tensioned concrete has great superiority over reinforced concrete in shear strength, because the prestress considerably increases the shear strength, particularly at the ends, there is no difficulty in avoiding this risk with reinforced concrete.

DONOVAN H. LEE
Consulting Engineer
London, England

CALENDAR

Concrete Reinforcing Steel Institute, annual meeting, The Greenbrier, White Sulphur Springs, W. Va., June 24-29.

World Conference on Prestressed Concrete, Fairmont Hotel, San Francisco, Calif., July 29-August 2.

Hydraulics Div., American Society of Civil Engineers, Kresge Auditorium, Massachusetts Institute of Technology, Cambridge, Mass., Aug. 26-28.

New England Water Works Association, 75th Annual Convention, Hotel Statler, Boston, Mass., Sept. 15-18.

Computer Conference, sponsored by U. S. Bureau of Public Roads, Hotel Somerset, Boston, Mass., Sept. 17-19.

Facts you can really get your teeth into

Roebling Bulletin PC-932 is designed to show what is being done and can be done with prestressed concrete members.

One section is devoted to the details and operation of casting beds. Another section gives engineering data for tensioning strands.

Rather than tell you *all* about it, we would prefer to send you a copy. You can use the coupon or write to Construction Materials Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

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Construction Materials Division
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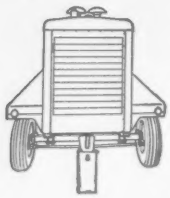
air compressor available!



Here's the rotary air compressor you've wanted — or designed with the operator in mind! It's a regular to nado on wheels — delivering a full 600 cubic feet of a per minute compressed to 100-120 lbs. pressure. An talk about economy — the automatic governor spee control permits the engine to loaf — saves fuel by th barrel!

The Le Roi Rotary 600 is a product of advance engineering developed and perfected with the highes degree of care.

It features unit construction, allowing major com ponents to be removed, repaired, and replaced withou removing adjacent assemblies. This practical desig simplifies maintenance, reduces overhaul cost.

LE ROI ROTARY 600 ... THE

LIGHTWEIGHT – COMPACT – RUGGED

LE ROI

It includes every modern compressor feature as an *integral* part of the design—*not* as added modifications.

For instance, a hydraulic positive-acting clutch is incorporated in the basic design to permit running the engine alone, thus increasing both engine *and* compressor life. Details like this and many others raise the Le Roi Rotary 600 to a class by itself.

As a result, it *delivers air* with the greatest efficiency and economy possible — with a machine whose operation and servicing establish new standards of simplicity for air compressors.

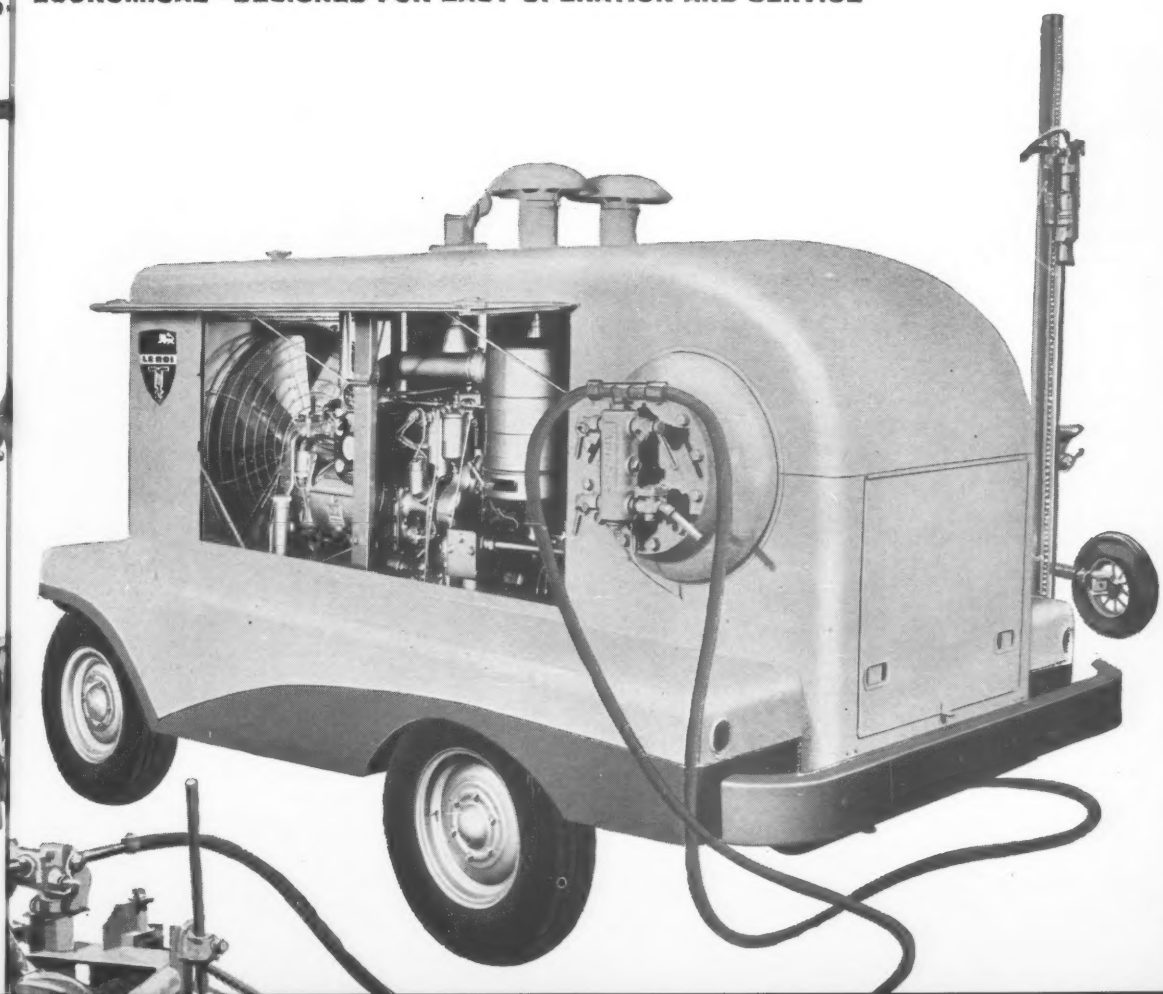
Turn the page and check all the features of the Le Roi Rotary 600 — they mean more air at less cost to you!

SPECIFICATIONS:

Capacity (free air)	600 cfm
Discharge pressure	100 psi
Full load speed	1800 rpm
Engine	GM 671 — 6 cyl.
Length	12 ft. 6 in.
Width	6 ft. 8 in.
Height	7 ft. 5 in.
Weight (dry)	7750 lbs.
Tires (4)	7.50 x 16 8 ply
Fuel cap.	82 gal.

NEWEST WITH THE MOST!

ECONOMICAL – DESIGNED FOR EASY OPERATION AND SERVICE



LE ROI ROTARY 600 AIR COMPRESSOR

LOOK AT THESE

LE ROI ROTARY 600

FEATURES...

COMPARE THEM

WITH ANY OTHER

ROTARY—

Two-stage, efficiently oil cooled rotary air compressor.

It's the lightest rotary in the 600 class — 7750 lbs. dry weight. That means economical hauling, easy on-site positioning, easy handling over rough or muddy ground.

Powered by a standard GM 671 diesel engine with 12 volt electric starter and cold weather ether starting device.

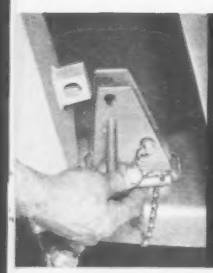
High capacity — a full 600 cfm compressed to 100 psi @ 1800 rpm.

Automatic governor speed control permits engine to loaf at less than ⅓ rated speed when compressor is unloading — a major fuel saver!

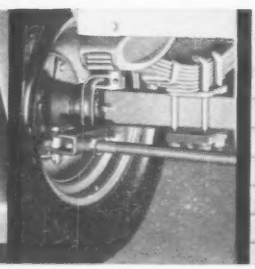
Engine and compressor have 3-point cushioned mounting which absorbs shock, cuts maintenance that might be caused by travel over rough terrain.

Compressor reaches 110 psi within ten seconds of start.

ONLY LE ROI GIVES YOU A

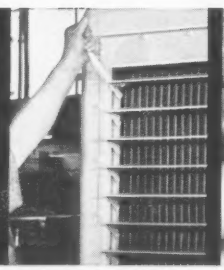


1 It's easy to lift and lock the towing tongue in the up position, with a positive lock type pin, at the job site or when storing the unit.



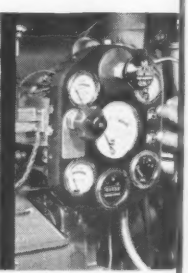
2 Positive automotive-type steering with a 12-foot turning radius and 7.50 x 16 8 ply tires makes it easy for you to tow the compressor to any working site.

3 The compressor has a fabricated welded steel tow-tongue with a built-in spring loaded towing eye designed to absorb the severest road shocks.

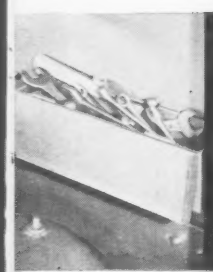


4 Diesel engine has pressurized cooling system, efficient at high altitudes, with 12 manual vane-type shutters for close adjustment of temperature control. One handle opens shutters to any position.

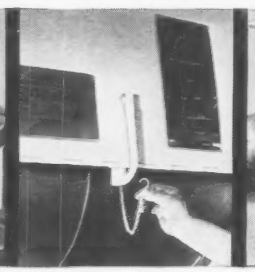
5 An automatic speed control system maintains constant, even air pressure at all times. A drain valve is provided to remove water daily from the system.



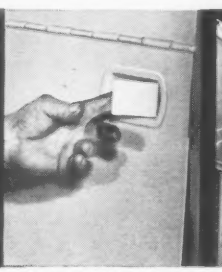
6 The unit is quickly started by pushing down with two fingers at the same time the fuel and starter engine switches are conveniently located on "working-side" instrument panel.



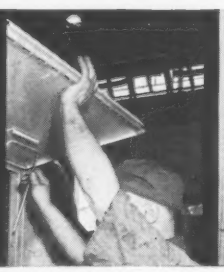
7 The unit has a handy metal box to store tools located inside the housing at the rear of the compressor. Tools may be stored at all times inside lockable housing doors.



8 A large, easy-to-open rear door can be locked in the up position offering better accessibility to the compressor. Operating instructions are conveniently located inside the door.

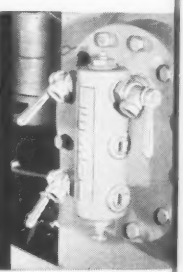


9 All six housing door latches can be opened with one finger, yet they securely hold doors locked when the doors are shut. Latches are flush-type — won't break off.

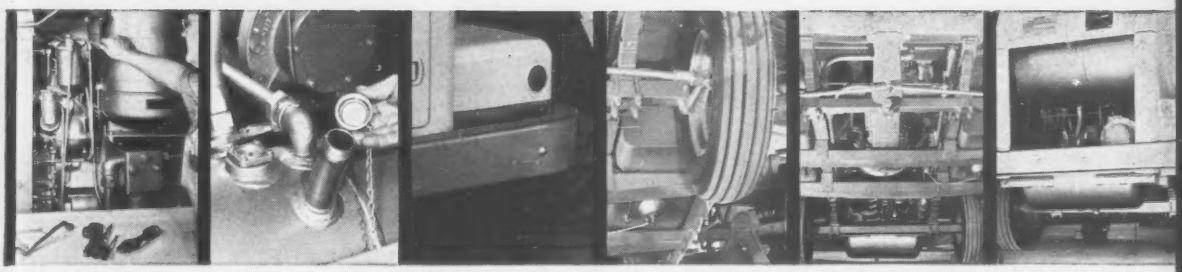


10 It takes only a minute to fold the lower door over the upper hinged half of the door and secure it in the open position with sturdy steel door braces.

11 Excessive receiver air pressure is released through a safety valve by a manually controlled wire trip located outside of the housing for added operating safety.



12 There are six 1 in. two 2 in. service o ings on the air re er manifold with r than enough outle connect air lines There are four ma service valves an drain valve.



13 Large low-set working height fenders provide plenty of room to place tools and parts when servicing your unit.

14 There's an oil reservoir gage to check oil capacity. An oil filter pipe on the reservoir is accessible through a lockable rear door.

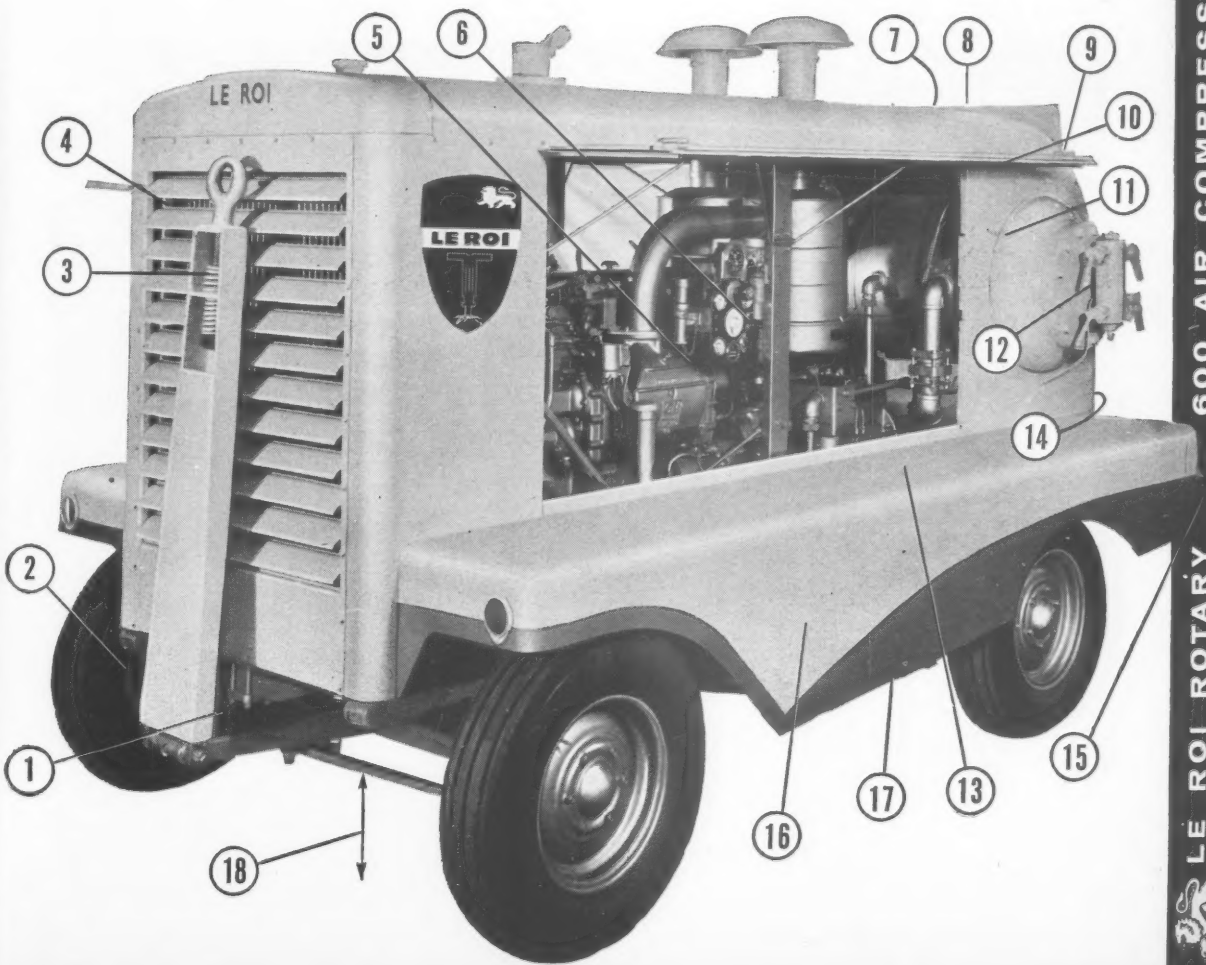
15 Rotary has a heavy gage molded steel bumper for added protection to the rear housing along with two glass reflectors to warn traffic of its presence.

16 41 gallon fuel tanks fully enclosed under each fender, safe from engine-compressor heat, distribute weight evenly. Permanently inter-connected, filled easily from either side — an operator convenience.

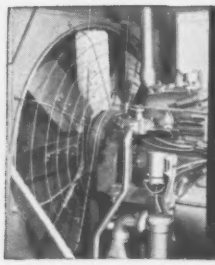
17 The heavy duty welded steel underframe is designed and built to withstand punishing treatment over the roughest terrain.

18 The 600 Rotary was designed for high clearance with a low center of gravity for easy towing over steep inclines and rough terrain.

ALL THESE ADVANTAGES!



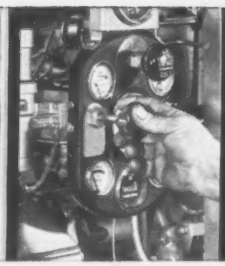
LE ROI ROTARY 600 AIR COMPRESSOR



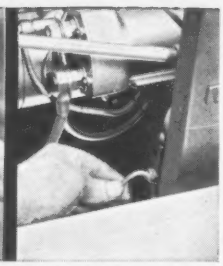
1 A steel wire shroud completely encloses a high velocity 8-bladed fan for added safety to the operator.

2 It's easy to fill each 41 gallon fuel tank with the filler pipe located fender-high and inside the lockable side doors of the housing. 82 gallons of fuel means "full-shift" capacity.

3 All compressor controls are grouped on central instrument panel which contains ether engine starting; engine-stop handle; starting and fuel switches; temperature, fuel, oil, air pressure, hourmeter, and ampere gages; and engine heater control.

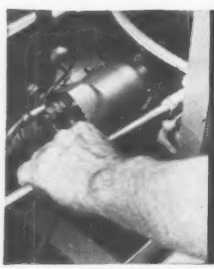


4 The instrument panel has manual control handle that pulls out to quickly stop the unit from operating



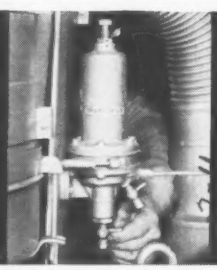
5 The clutch pump by-pass valve is open while the clutch is engaged. All you have to do is close the valve when you want to disengage the clutch.

LE ROI DESIGN MEANS TOP

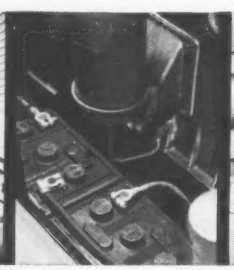


6 A handle is provided to pump oil to the clutch to disengage the engine drive from the compressor for easier starting and engine warm-up. This system also allows engine adjustment while operating without any compressor load.

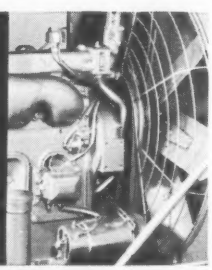
7 Working-side location of the engine oil filler pipe is another feature making it easy for the operator to replenish engine oil.



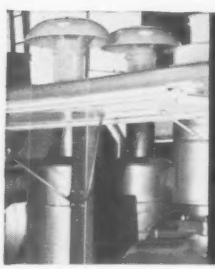
8 A precision built pressure regulator automatically controls compressor speed and regulates air pressure in the receiver. Two drain valves are accessible from either side to remove water daily from the regulator.



9 A 12-volt battery system located next to the fender makes it easy for the operator to check the battery fluid and battery cables. With its compact housing design it's also easier for you to reach in and change the engine oil filter.



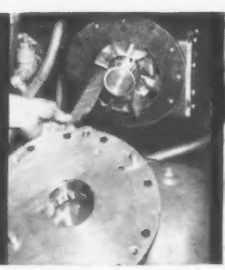
10 The engine generator, voltage regulator, oil pressure and water temperature controls are easy-to-get-at for servicing.



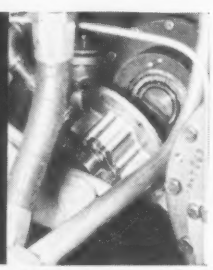
11 Two large capacity air intake cleaners supply plenty of filtered air to the compressor and engine. A heavy duty engine muffler directs exhaust out through the top of the housing.

12 Water is easily removed from the air intake manifold by a drain valve conveniently located on the manifold and accessible from the side of the unit.

13 You can easily remove, inspect and replace clutch discs from outside the compressor through hand-hole openings provided in the clutch housing. No engine or compressor disassembly is needed.



14 Rotor vanes can be inspected within a few minutes — right in the field. By removing eleven capscrews and the end cover from the compressor cylinders, rotor vanes can be pulled out for inspection or replacement.

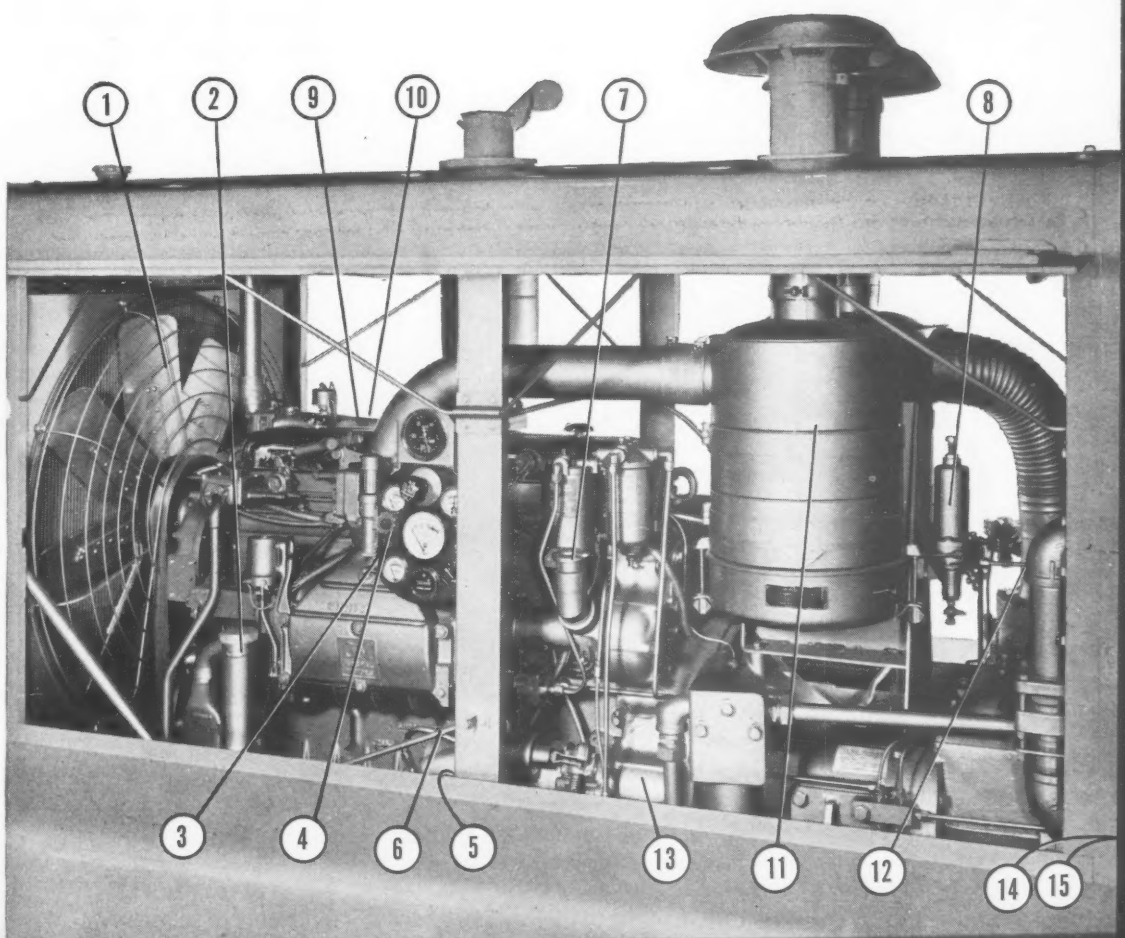


15 It's easy to remove the oil pump from the compressor. Remove a few capscrews and the pipe connection to pull out the oil pump assembly — this can be done in a matter of minutes.

Under the hood, the Le Roi Rotary 600 is packed with superior design features you can't see, but that show up best in low maintenance costs and dependable performance. For instance, all housing assemblies are doweled and step-fitted to give perfect alignment and insure minimum distortion between parts even in the toughest service on rough, broken ground.

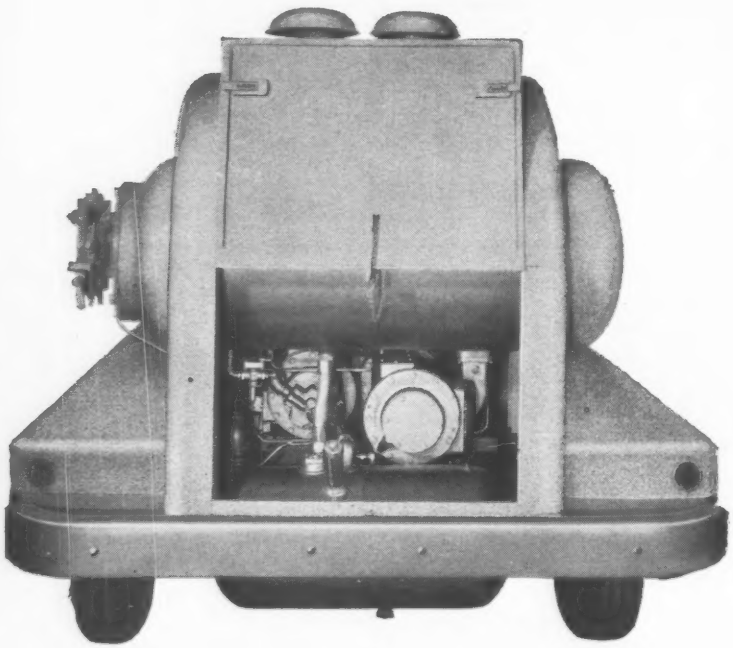
Roller bearings are used throughout the compressor for long life. Quiet, helical gears run in a constantly changing filtered oilbath. Points like these — and many more — are typical of the quality that makes the Le Roi Rotary 600 an outstanding buy! You'll find that no other compressor can match this new Le Roi unit in advanced design and top performance features.

QUALITY INSIDE, TOO!



The Le Roi Rotary 600 is like no other compressor built. It's the modern unit . . . tomorrow's compressor available today! See it yourself . . . try it . . . you'll buy it if quality and economy are your watchwords

UNIT CONSTRUCTION . . .



The Le Roi Rotary 600 Is the Only Rotary Built With Unit-Construction, Side-By-Side Individual Cylinders!

That means:

. . . short down-time on repairs!

. . . all components easily removable without disassembly of other parts!

. . . unit can be serviced and maintained in the field!

. . . can be serviced with the simplest mechanic's tools: screwdriver, pliers, crescent wrench!

. . . no bearing puller needed!

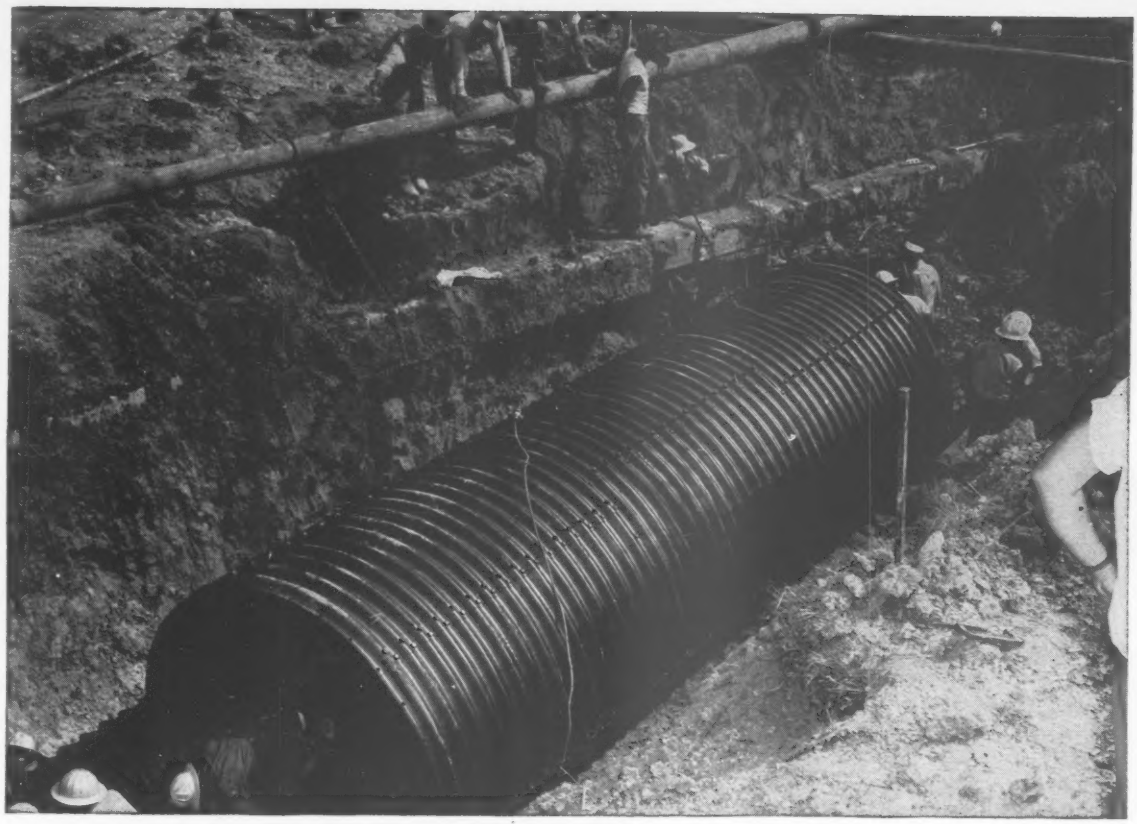
. . . periodic vane inspection is easily accomplished in minutes instead of hours!

. . . component parts are less expensive, replacements are low-cost items!

LE ROI DIVISION • Westinghouse Air Brake Co.
MILWAUKEE 1, WISCONSIN

Manufacturers of Newmatic air tools, portable and Tractair® air compressors, stationary air compressors, and heavy-duty industrial engines. Write us for information on any of these products.

WABCO



PITT CHEM-Protected Storm Mains Go Down TO STAY!

Here's another "natural" protection job for heavy-duty *Pitt Chem* Tar Base Coatings—adding life insurance to underground storm sewer mains near Baton Rouge, La.

Assembled above ground in 30 to 40 foot lengths, the big sections were spray-coated inside and out with Pitt Chem 101, one of the most impervious coatings ever made from coal tar pitch. The sections were then lowered into the ditch and bolted together to form a 4,500 foot main, ready for years of trouble-free service.

If your corrosion job is as tough, or *tougher,* than this, you'll want to investigate Pitt Chem Tar Base Coatings soon. There's a formulation to control virtually every major type of corrosion. And that includes the Chemical, Petroleum, Marine and Water & Sewage industries.

Call for a Pitt Chem man to survey *your* corrosion problem today. A call or wire will place him at your immediate service.

PITT CHEM 101—For Severest Conditions
PITT CHEM 102—Maintenance Coating
PITT CHEM 103—General Purpose Coating
PITT CHEM 104—Potable Water Service
PITT CHEM 105—AQUATAR®-Water Dispersion
PITT CHEM 106—TARMASTIC®-Sealing Compound
PITT CHEM 107—PACHKOTE®-Specialty Coating
PITT CHEM 110—Special Seal Coating
PITT CHEM TARSET®—Coal Tar-Epoxy Coating

WSW 6678

PROTECTIVE COATINGS DIVISION
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COAL CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

7 needs for steel pipe snow melting in this one highway interchange!

The efficiency and safety of a highway in the snow belt is no better than its provision for snow and ice removal. Scientific grades, curves, approaches, road surfaces, even vehicle tires and controls, have improved highway efficiency . . . but plowing, cindering and salting are still only half measures.

Complete "weather control" requires automatic steel pipe snow and ice melting systems . . . especially at strategic areas such as overpasses, elevated ramps and approaches, bridge floors and toll gates where stalled cars and trucks can disrupt traffic flow for miles-in-between on the passable straightways.

Highway engineers now incorporate steel pipe snow melting systems in their plans and already snow melting installations are functioning in the Indiana Toll Road plaza areas, elevated ramps to the New York bus station, to the Staten Island Ferry Building and elsewhere.

Steel Pipe is first choice, of course, for the heat transmission lines and grids . . . the most widely used pipe in the world for snow melting, radiant heating, fire sprinkler systems, electrical raceways, steam, air and fuel transmission lines.

A free booklet "Steel Pipe Snow Melting and Ice Removal Systems" is available for the asking. Write today.

Steel Pipe is First Choice

Committee on
STEEL PIPE RESEARCH
AMERICAN IRON AND STEEL INSTITUTE
150 EAST FORTY-SECOND STREET,
NEW YORK 17, N. Y.

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THE CONSTRUCTION WEEK

ROCKY REACH BIDS REJECTED—The Chelan County PUD of Wenatchee, Wash., on June 20 rejected all three bids it had received one week earlier for the general contract to complete Rocky Reach Dam on the Columbia River. It invited new proposals for opening July 23. Bids had to be rejected, said PUD officials, because a state law prevents award when bids exceed the engineer's estimate. Stone & Webster Engineering Corp. estimated the work at $55.3 million. Apparent low bidder at $58.6 million was a joint venture of Morrison-Knudsen, Henry J. Kaiser, Peter Kiewit Sons and Perini. Rocky Reach Dam Builders, now engaged in first stage work, with Guy F. Atkinson added came in at $61.3 million. Merritt-Chapman & Scott bid $63.5 million. The bids covered completion of the concrete dam and powerhouse and installation of mechanical equipment. Rocky Reach Dam, scheduled for 1961 completion, will consist of an L-shaped concrete gravity structure 3,000 ft long and an earth cutoff extending 2,000 ft into the east bank. Initial development calls for 775,000 kw capability. The Chelan PUD, thus far has awarded $33 million of contracts, including generators, turbines, spillway gates and transformers. Final cost of the project is expected to be somewhat less than the original estimate of $250 million.

MORE PORT COMPETITION?—Port officials—and shippers—are watching with interest this week New York City's attempts to get out from under rail rate differentials that favor ports further to the south. Elimination of the three-cents-per-100-lb extra charge would greatly strengthen New York and Boston in their battle for trade with the ports of Baltimore, Philadelphia, Norfolk—and with new ports to be opened up by the St. Lawrence Seaway. Commented the big town's Mayor Robert Wagner: New York has been steadily losing business—though it is still the No. 1 U. S. Port—despite expenditure of millions to modernize facilities. Answer is to reduce the freight differential, which was equalized by smaller ocean shipping charges when put into effect, but is now considered to be wiped out as shipping rates have gone up.

MONORAIL FOR DETROIT?—Despite the many as yet untried features of the system, Detroit's Rapid Transit Commission says it is considering a 24 mile monorail system, to cost $173 million, and to be integrated with surface rail lines. The proposal would include 20 parking lots at outlying sites and 50 passenger stations along the monorail line itself. Big problems with monorail: Switching (which would require movable bridges at switch points); final design of structure to carry the cars; effect of high-speed turns on passengers; deceleration at station stops. Commission members said the monorail would operate at an average rush hour speed of 51 mph.

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WASHINGTON OBSERVER

- Hells Canyon vote fuels politics
- Idaho Power gives up tax aid
- Niagara plant prospects brighten
- Engineers fight TVA bill feature
- Drive on to end urban renewal

- **Senate approval of a federal high dam at Hells Canyon** keeps alive the political fight over public vs. private power and the Administration's policy of letting private enterprise take over natural resource development if it can be done at less cost to the taxpayer.

  Democrats in the House hope they can get a favorable vote too, although they know the odds are against them. They think they can swing opposition votes on the basis that President Eisenhower will veto the bill anyway, if it should pass.

- **Idaho Power Co.'s capitulation on its fast tax write-offs** for the low dams at Hells Canyon also adds fuel to the public-private power fight. The company, under running attack by westerners favoring the federal high dam, decided to turn in its certificates which gave it five year write-offs on 60 to 65% of the cost of the $103 million project, on which construction proceeds around the clock. Already, there's talk about having other utilities give up their tax benefits, too.

- **The Senate Public Works Committee's approval of a Niagara bill** brightens chances for passage of legislation to permit construction of the $600 million plant by the Power Authority of the State of New York. The key compromise would reserve about half the plant's output for preference customers. And on PASNY's second front in this battle to get started building power on the Niagara, a moral victory was won last week: The U. S. Court of Appeals invalidated as "purely domestic" the clause in the Niagara treaty with Canada reserving to Congress the choice of who should develop U. S. power there.

- **Professional engineers are fighting a proposal for TVA** which, they say, would put TVA's own staffers into competition with private consulting engineers. Language in Senator Kerr's bill to give TVA authority to issue its own revenue bonds would let the agency perform engineering as well as construction work on power plants of neighboring utilities it might lease, buy, or use as a source of power.

- **Budget-cutters in the Administration hope to kill urban renewal** as one way of holding down government spending in future years. Both Secretary of Treasury Humphrey and Budget Director Brundage admit that so far the urban renewal program has cost only about $90 million. That is the federal government's share of the cost of acquiring blighted land for sale to private redevelopers. **Some $900 million has already been committed.** But the economizers would like to end the program next year. They want to cut urban renewal out of the President's budget that will go to Congress next January, covering the year beginning July 1, 1958. **Congress, however, is adding to the total by approving funds** for HHFA to commit during the next 12 months. This may turn out to be either $250 million for one year, or $500 million over two years.

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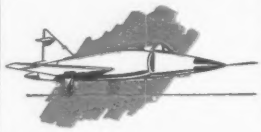

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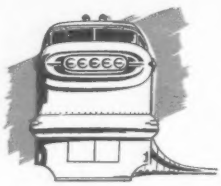

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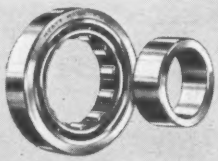

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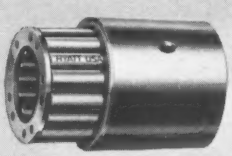
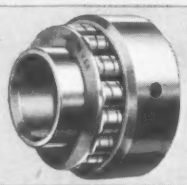
For industrial trucks, textile machinery, gear pumps, conveyors, hoists and agricultural equipment.





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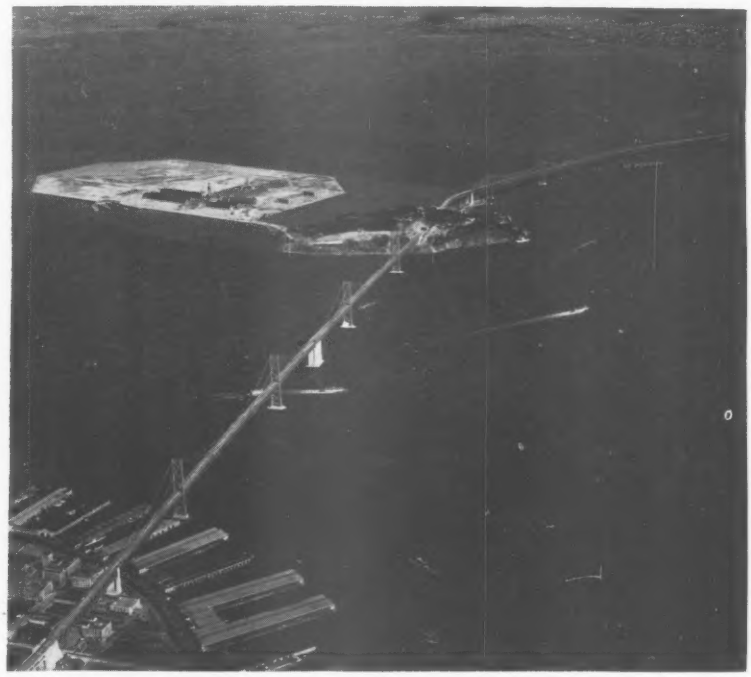


Bridges, such as the Oakland Bay Bridge (right), are key features in San Francisco area, where legislative action has set up the equation:

Transit+Roads=Metropolitan Movement

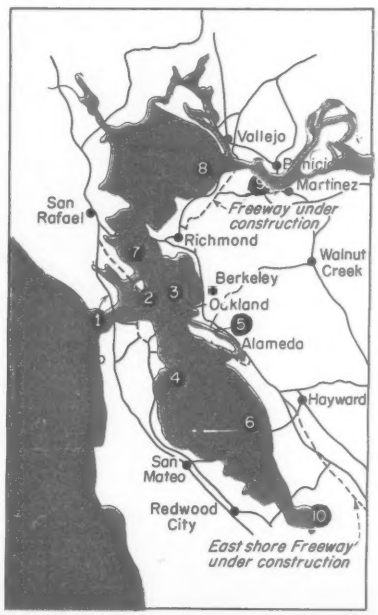
In actions that place nearly equal weight on mass rapid transit and highway facilities, California's legislature has taken a series of strong actions to solve San Francisco's water-complicated transit problems.

Before reaching adjournment, the legislators:

• Established a San Francisco Bay Area Rapid Transit District, armed with taxing powers, to proceed with construction of a unified transit system for the populous region.

• Approved removal of the Key System's rail lines on the lower deck of the San Francisco-Oakland Bay Bridge, to clear the way for repaving the deck to increase the structure's vehicle capacity.

• Approved construction of a second two-lane tunnel between Oakland and Alameda, with financing to come out of regular highway revenues, rather than from a bond issue.



The Key Bridges:

1. Golden Gate Bridge; 2. Tiburon Bridge; 3. Bay Bridge; 4. Southern Crossing; 5. Posey Tube; 6. San Mateo-Hayward Bridge; 7. Richmond-San Rafael Bridge; 8. Carquinez; 9. Martinez-Benicia; 10. Dumbarton Bridge, is part of area's transportation package.

• Appropriated funds for study of a new bridge crossing of the south arm of the bay to parallel the existing two-lane San Mateo-Hayward Bridge; or in lieu of that to widen or double-deck the existing structure.

• Authorized studies of a major crossing—which would include two suspension spans of 3,600 ft, one 2,500 ft—between San Francisco and the Tiburon peninsula to the north in Marin County.

• Approved legislation which many observers believe is a death knell for the long-proposed southern crossing of San Francisco Bay.

All of the actions are in fact a part of a closely tied package aimed at unsnarling the huge traffic headache that has resulted from the almost insular position of San Francisco itself, and the many waterways that cut it and its rapidly growing neighbors from each other.

• **Mass transit**—Of perhaps greatest interest to all other growing metropolitan areas was the creation of the Rapid

. . . Solution for San Francisco's water-complicated transit problems

Transit District—a permanent entity to supplant an appropriation-supported predecessor study group, the San Francisco Bay Area Rapid Transit Commission. This commission, as its major act, had produced an engineering report (ENR Jan. 19, 1956, p. 25) that recommended the inclusion of nine counties in a series of transit loops that would serve major population and business centers in the area.

The new legislation takes the commission's study farther and nails down some definite points which had been the subject of considerable debate.

It limits the district created to five counties—San Francisco, Marin, Contra Costa, Alameda and San Mateo; eliminating Santa Clara, Napa, Sonoma and Solano. However, these counties may later enter the district, and are entitled to assign non-voting official observers to sit in on all deliberations of the district's board.

Of signal importance was the lawgivers' approval of taxing powers for the district—up to 5 cents per $100 of assessed valuation—to finance detailed planning. (The commission operated under a special legislative appropriation, and had no taxing powers.)

A third major provision is a means of obtaining approval of district construction plans by taxpayers who will be affected. Under the legislation, the district will submit its plans to the county commissioners of the county involved. If this first plan is rejected, a second, revised plan may be submitted. If the second plan is rejected, the county will automatically be dropped out of the district. However, if the plan is accepted, the matter will then be put to a taxpayers vote.

• **Bridge plans**—On the highway side of the picture, the two studies of new bridge facilities and the approval of changes on the Bay Bridge are closely related to each other—and to the dim prospects for the long proposed southern crossing.

An enlarged or rebuilt San Mateo-Hayward Bridge—a two-lane crossing built in 1929 as a private structure and bought over by the state in 1951—and the increase in capacity of the Bay Bridge might together provide sufficient traffic capacity to handle transbay needs for perhaps another 10 years, some engineers believe. The Bay Bridge change would provide five lanes of traffic in each direction at a cost of $35 million.

The proposed structure to the Tiburon peninsula would supplement the existing Golden Gate Bridge, and while the legislature put up $100,000 for a study, most observers believe actual construction is "years away."

• **Southern crossing**—The action on the southern crossing is directly related to the added cost of converting the lower deck of the Bay Bridge to full motor vehicle operation.

A previous legislature had directed construction of the second bay crossing at between Army St. in San Francisco and Bay Farm Island on the Oakland side. The just-closed session has now placed the limitation on this project that if it cannot be financed by July 1, 1958, the whole project will be killed.

Financial studies of the southern crossing, meanwhile, have indicated that sale of bonds even for a "minimum" $180 million construction project at the Army St.-Bay Farm Island site would be extremely difficult if based solely on a proposed 25 cent toll for the crossing. Thus, revenues from the existing Bay Bridge would have to be used to bolster the southern crossing bonds.

Now, authorization of the $35 million job on the Bay Bridge casts a further cloud on this financing arrangement, since some Bay Bridge tolls would have to go to pay for the new work.

• **Tunnel too**—Further confusion concerning the southern crossing is added by that part of the legislation authorizing the second tunnel (Webster St. tunnel) between Oakland and Alameda. This tunnel has always been considered as the most important approach element to the southern crossing.

By a bit of bookkeeping change, the legislature appeared to help prospects for the entire crossing: It was enacted that the estimated $20 million cost of the tunnel be financed under the regular state highway fund, and thus that $20 million be subtracted from the total cost of the southern crossing.

But observers were quick to point out that placing the tunnel under general highway financing from revenues may put it even farther back on the list of construction possibilities. The tunnel job will now have to compete with other major highway developments for funds; the Highway Commission is free to place it on its next budget—or defer it.

• **Other projects**—On other San Francisco Bay area bridge questions these developments can be reported: (1) Use of the Richmond-San Rafael Bridge continues to fall behind traffic estimates. Bonds are not in jeopardy, but the margin is far slimmer than originally expected. (2) First steel went into place for the Carquinez Bridge in mid June. (3) And no word has yet been forthcoming on bid calls for the planned Martinez-Benicia crossing to be located a few miles upstream from Carquinez. The Martinez Bridge was authorized at the same time as Carquinez and tolls from both crossings will repay bonds on both. The delay is due to failure as yet to reach agreement on an approach route through the Army's Benicia Arsenal.

It Isn't Snowing Now, But . . .

When the snows come next winter, there won't be any slippery sidewalks around the new C. I. T. Finance Corp. Building in New York. Almirall & Co., Inc., New York City plumbing and heating contractors, are installing a snow-melting network under the sidewalks on all three street sides—59th St., 60th St. and Madison Ave.

The system will contain seven tons of 1¼ in. and ¾ in black-steel pipe, with welded connections, and will circulate about 1,500 gal of light oil, heated to 140F. Pipe centers will lie 3¾ in. below the finished sidewalk surface.

Designed by Harrison & Abramovitz, New York City architects, the black-granite-clad building has been under construction for about 1½ years by the George A. Fuller Co. Completion is scheduled for next month.

The snow-melting system was designed by Jaros, Baum & Bolles, mechanical engineers, New York City. Dudley Thyng is project engineer for Almirall.

ASTM Adopts New Reinforcement Specs

Tentatives approved for strands, big bars and rods in coils—increase in A7 steel yield point rejected

The 60th Annual Meeting of the American Society for Testing Materials, held in Atlantic City, N. J., the week of June 16, set several new records for that organization. About 950 committees met during the week, and 31 technical sessions were held, during which nearly 100 papers were presented. Attendance exceeded 3,000 for the first time.

Action was taken on several important specifications concerned with construction materials. Included was a ruling affecting structural steel and approval of specifications for strands for prestressed concrete and new types of concrete reinforcing.

Richard T. Kropf, of New York City, was elected president. He is vice president and director of research, Belding Heminway Co. and vice president and general manager, Belding Corticelli Industries, Inc.

F. L. LaQue, vice president and manager, Development and Research Division, International Nickel Co., New York City, was elected vice president for a two-year term. Kenneth B. Woods, professor of highway engineering, Purdue University, continues as vice president for another year.

Stanton Walker, director of engineering, National Sand and Gravel Association, Washington, D. C., received the Frank E. Richart Award for his research in the field of concrete and aggregates. For work in the same field, T. C. Powers, manager, Basic Research Section, Portland Cement Association, Chicago, was honored with the Sanford E. Thompson Award. For outstanding service in the study of water as an engineering material, Robert C. Adams, superintendent, Chemical Engineering Laboratory, U. S. Naval Experiment Station, Annapolis, was given the Max Hecht Award.

• **New specs for reinforcement**—Committee A-1 on Steel approved the first specification developed specifically for prestressed concrete. Developed by Subcommittee V, Steel Reinforcement Bars, the new tentative covers seven-wire, uncoated, stress-relieved steel strand primarily intended for use in pretensioned, bonded concrete construction.

Subcommittee V also forwarded to A-1 a specification for hot-rolled plain rods in coils for use as reinforcement. It contains a controversial provision permitting a tolerance of ½ in. in diameter. (Rods, as rolled, may be elliptical in cross section.) Inasmuch as rods are rolled primarily for other purposes than concrete reinforcement, the mills would not change the tolerance, which is acceptable for those purposes. Consumers appeared to be satisfied with the ½ in. tolerance. (Concrete pipe manufacturers are the chief users of coil reinforcement at present.) So despite objections from a minority of members, the subcommittee decided to recommend the specification for adoption as a tentative.

However, a similar specification for deformed rods in coils for use as concrete reinforcement was not approved. In that case also, the objection was to the ½ in. tolerance in diameter.

ASTM approved as tentative a specification for special large-size deformed billet-steel bars for concrete reinforcement. These bars will be known as No. 14S and 18S. The No. 14S has a nominal diameter of 1.693 in. and an area of 2.25 sq in., while the No. 18S has a diameter of 2.257 in. and an area of 4 sq in.

These large bars are outside the scope of the Specifications for Billet-Steel Bars for Concrete Reinforcement (A15) and for Minimum Requirements for the Deformations of Deformed Steel Bars for Concrete Reinforcement (A305). (Apparently, the special bars are intended for use in columns and not in beams or tension members.) Data on bond, such as are available from tests of the standard bars, have not yet been developed for the large bars.

• **A7 change defeated**—At the request of the code committee of the American Institute of Steel Construction, Subcommittee II, Structural Steel, of A-1, considered a proposal to increase the yield point of structural steel covered by specification A7.

The AISC committee had under consideration an increase in allowable tensile stress for A7 steel from 20,000 psi to 24,000 psi. But the committee decided not to increase the allowable stress without a proportionate increase in yield point.

Subcommittee II raised a number of objections to a higher yield point—principally that ductility, toughness and weldability would suffer. It recommended that the yield point be maintained at 33,000 psi.

In other actions at this meeting, Tentative Specification for High-Strength Rivet Steel (A-195-52T) was recommended for advancement to a standard. Also, approval was given to a proposed Tentative Specification for High-Strength Structural Alloy Rivet Steel.

• **New concrete specs**—Committee C-9 on Concrete and Concrete Aggregates recommended two new tentatives: Specifications for Raw or Calcined Natural Pozzolans for Use as an Admixture for Portland Cement Concrete and Method of Test for Measuring the Rate of Hardening of Mortars Sieved from Concrete Mixtures by Proctor Penetration Resistance Needles.

Tentative Specifications for Concrete Aggregates (C33-56T) was advanced to a standard with some revisions.

Still under development are statistical methods for evaluating the compressive strength of concrete, test for pozzolans in concrete and test for quantity of cement in fresh concrete.

Committee C-13 on Concrete Pipe withdrew the Standard Specifications for Reinforced Concrete Sewer Pipe (C75-56) and Reinforced Concrete Culvert Pipe (C76-56). Instead it recommended a single tentative—Reinforced Concrete Culvert, Storm Drain and Sewer Pipe (C76-57T), which was approved by the society. A specification for concrete drain tile is being developed by Subcommittee VI.

Committee C-12 on Mortar for Unit Masonry approved Tentative Specifications for Aggregates for Masonry Grout, for use for reinforced masonry.

Committee C-3 on Chemical Resistant Mortars recommended a Tentative Specification for Resin-type Chemical-Resistant Mortars. It also approved three recommended practices: (1) Use of chemically setting silicate-type chemical-resistant mortars; (2) use of hydraulic cement mortars and (3) use of resin-type chemical-resistant mortars.

• **Soil specifications**—Committee D-18 on Soils for Engineering Purposes approved two new tentatives: Method of Thin Walled Tube Sampling of Soils and Method for Penetration Testing and Split Spoon Sampling of Soils.

Three tentatives were advanced to standards: Test for Bearing Capacity of Soil for Static Load on Spread Footings (D1194-52T); Repetitive Static Load Tests of Soils, for Use in Evaluation and Design of Airport and Highway Pavements (D1195-52T); and Nonrepetitive Static Load Tests of Soils, for Use in Evaluation and Design of Airport and Highway Pavements (D1196-52T).

Now under study are methods or recommended procedures for reconnaissance techniques of air photography, pedologic methods and geophysical re-

connaissance. Under consideration is the preparation of standards for consolidation, unconfined compression and triaxial shear tests on soils. A new method for determining field density of soils, by the sand cone method, is under development. Also being studied are test methods for load capacity for batter piles, lateral load capacities for piles and load capacities for pile groups.

Noteworthy Papers at ASTM Meeting

Among the nearly 100 papers presented at the 60th Annual Meeting of the American Society for Testing Materials last week several are of unusual interest to the construction industry.

MYSTERIOUS BEHAVIOR

E. G. Swenson, Division of Building Research, National Research Council of Canada, reported on a study made of a concrete bridge deck in eastern Canada that had expanded abnormally over a period of more than 25 years. The standard mortar bar test (C227-52T) failed to reveal potential reactivity in the source material in spite of other evidence.

The deck consists of two sections made with different aggregates and cements. Aggregate in the south section was found to be of rock types regarded as somewhat potentially reactive with high alkali cement, including phyllites, chalcedonic sandstones, meta-sandstones and somewhat chalcedonic limestones. In the north section, the coarse aggregate was a carbonaceous and dolomitic limestone, not considered deleteriously reactive with high alkali cement, whereas the sand was composed predominantly of granites, gneisses, sandstones, quartzites and other crystalline types. Potentially deleteriously reactive rock types constituted only about 1% of the sand sample examined.

Failure of the mortar bar test to indicate potential reactivity of the south-section aggregate may be due to any one of several possible factors, indicating that the test is not completely reliable. Freezing and thawing may have been responsible to a large extent for deterioration and expansion.

Abnormal expansion in the north section may have been due to the sand, which tests made during the study showed was susceptible to a type of cement-aggregate reaction revealed by the Conrow Test (C342-55T).

Mr. Swenson also described studies made of abnormal expansion and map cracking of concrete in sidewalks, curbs, floors and foundation walls in Kingston, Ont. In these cases too, standard ASTM tests were negative. A dolomitic limestone used as coarse, aggregate was shown to have been responsible.

BETTER CONCRETE FLOORS

James L. Sawyer, research chemist, Lone Star Cement research laboratory, Hudson, N. Y., described some modifications to improve sensitivity of a German standard test measuring resistance of concrete floors to wear.

The German test duplicates a practical wear condition by rolling steel balls under pressure over the concrete surface. The concrete is subject to abrasion caused mainly by rolling and sliding friction accompanied by some pounding or beating force.

The test is sensitive to differences in surface conditions, Mr. Sawyer reports, as well as conditions under the top surface. Thus, it can ascertain the effect of varying finishing procedures, curing and drying conditions, mix proportions and differences in aggregates and cements.

Results to date indicate that if the maximum wear resistance is desired from any concrete, curing must be adequate, particularly with leaner mixes. Expected moisture conditions of the floor surface in service must be considered in design of the floor, since moister surfaces show greater wear.

A definite relationship appears to exist between compressive strength and wear resistance. However, compressive strength alone cannot take into account the other factors affecting wear resistance.

CONCRETE HARDENING

T. M. Kelly and D. E. Bryant, vice president for research and senior research assistant, the Master Builders Co., Cleveland, Ohio, described a method for measuring the rate of hardening of concrete. It is based on the rate of development of bond as indicated by pulling out pins embedded in the concrete.

Data developed show that rate of hardening is significantly affected by changes in water-cement ratio, consistency, air content and storage temperature. The test method may be used to determine the quantities of retarders or accelerators needed for controlling this rate at a given temperature.

CONCRETE-BENDING TESTS

Stanton Walker and Delmar L. Bloem, director and associate director of engineering, National Ready Mixed Concrete Association, Washington, D. C., claimed that the flexural strength test of concrete is not suitable as a quantitative basis for acceptance or rejection.

The strength indicated by the test is more significantly affected by relatively obscure factors than is commonly realized, they said. They recommend that the relationship between flexural strength and compressive strength be determined from laboratory tests with materials to be used in the field and thereafter compression tests be used as the basis of acceptance.

TRUCK MIXER PERFORMANCE

Albert G. Timms, consulting engineer, Plainfield, N. J., described tests made to measure the performance of concrete truck mixers of the inclined-type under field conditions. Various methods of loading were studied and the amount of mixing was varied from 50 to 150 revolutions. He reported:

Good uniformity was obtained when water was introduced into the mixer at the batching plant.

A minimum of 50 revolutions of the drum are generally sufficient to produce uniformity.

Increasing the number of revolutions improves uniformity of relative strength under the poorest loading conditions tried in these tests.

A paving-type concrete with less than 2 in. slump can be produced readily in truck mixers, and even these low-slump concretes can be discharged rapidly without segregation of ingredients.

In general, mixers performed as well when mixing a 5 cu yd load as with 4 cu yd.

MORTAR DISINTEGRATION

C. C. Connor, consultant, Masonry Construction and Maintenance, Verona, N. J., and W. E. Okerson, engineer, New Jersey Bell Telephone Co., Newark, N. J., reported on an investigation of a type of mortar disintegration in the brick walls of 64 sea coast buildings constructed from 1945 to 1954.

The study indicated that disintegration was caused by efflorescence containing sodium and potassium sulfates. The source of these salts apparently was the cements used.

As far as could be determined, mortars containing cement having more than 0.6% sodium and potassium oxides (soda equivalent) were consistently associated with disintegrations. Brick with heavy sanding tended to increase disintegration, but rough-surfaced brick reduced it. Damage increased with time.

CLAY STRENGTH TEST

W. J. Eden and J. J. Hamilton, of the Building Research Division, National Research Council of Canada, described a simple field vane apparatus readily adaptable to existing drilling equipment for determination of shear strength in sensitive clay.

The vane has been used in the Leda clay in the St. Lawrence lowlands. The authors report it gave more reliable data than obtained by piston sampling and is more economical than tube sampling and laboratory testing.

AT ASEE MEETING President William L. Everitt (left) passes the responsibilities of office to Frederick C. Linvall. With teacher recruiting their biggest problem and salary supplementation their best answer, ASEE speakers call . . .

Research: A Must for Educators

Dean William L. Everitt, outgoing president of the American Society for Engineering Education, sounded a keynote for the 2,000 members of his society, meeting at Cornell University last week, when he called the attracting and keeping of engineering teachers "the most critical problem facing engineering colleges today." Much of the meeting was devoted to this problem.

Dean Everitt, dean of engineering at the University of Illinois, wound up his term as ASEE's president receiving the society's Lamme Award and passing along his tasks of the presidency to Prof. Frederick C. Linvall, chairman of the division of engineering at California Institute of Technology. The new vice president of the society is Ralph A. Morgan, director of the Purdue Research Foundation.

Figures for the shortage of engineering teachers cited were these:

Engineering colleges are already short 750 teachers, will need an 18% increase in faculties by next fall.

In 10 years the number of engineering educators needed will have grown 65% from present numbers..

Reasons for the shortage were seen by meeting speakers as none that money could not change. Salaries should be increased immediately by 45% to make them comparable to those in non-teaching engineering jobs, according to William H. Miernyk, director of the Bureau of Business and Economic Research at Northeastern University. He cited this figure as an estimate by engineering deans.

Solutions to the problem were suggested by Dean Everitt as attainable only through "new and radical methods of attack." Speaker John W. Hoffman, associate director of the Engineering Experiment Station at Michigan State, specified more extensive industrial support of research as the best way to bolster teaching salaries.

• **Stick to research**—Professor Hoffman went so far in his argument for more research as to criticize strongly the current situation in which teachers turn to consulting and summer employment in industry for supplemental income.

"In no way do I want to imply that the arrangements on consulting and summer employment . . . have not been beneficial; but I believe that it is now time to re-examine this practice to see whether it is most conducive to producing the type of staff which is necessary to train tomorrow's engineering product," said Professor Hoffman.

• **Back to basics**—And through most of the discussions and committee reports at this annual ASEE meeting it was obvious that "tomorrow's engineering product" will be getting more basic engineering sciences, plus humanities and social sciences.

Significantly, the only real exception taken to this back-to-fundamentals recommendation in 1955 of the Committee on Evaluation of Engineering Education (the Grinter Report) and the subsequently published "Additional Criteria" of Engineers' Council for Professional Development was the opposition of some civil engineers. At Cornell last week a subcommittee of ASEE's Civil Engineering Division reported findings of a survey of C. E. educators and employers.

• **C. E.'s object**—The civils' basic objection to the Grinter Report was that it recommended too great a reduction in the "civil engineering" in the curriculum. Objectors argued this is unsatisfactory since C. E. graduates are hired largely by employers not accustomed to providing extensive training programs. It was thought that employers wanted graduates already trained.

The subcommittee's survey concluded that, whether because of the Grinter Report or not, civil engineering curricula are indeed in a period of accelerated change. and the changes are tending to put more math and engineering sciences into course work. The subcommittee finds that "employers are reasonably well satisfied with recent graduates," but it concluded that "change toward a more scientific curriculum will require a reorientation of employers as well as of curricula." Further, "the feeling seems to exist . . . that further increases in . . . engineering sciences will be possible only if the four year curriculum is abandoned."

• **And further on research**—Engineering colleges and universities now have $101 million worth of research under way—$63 million sponsored by military agencies (and thus often of a restricted nature on which a masters or doctoral thesis can't be written); $6 million sponsored by non-military government agencies; $10 million by the institutions themselves; and the remainder—some $22 million—by industry.

ASEE is now doing a $40,000 study of research capabilities and potentials in the engineering colleges. The funds came from the National Science Foundation. Survey Director R. H. Ramsey, reporting progress of the study, said, "We need to be sure that each member of our faculties has challenging research opportunities for himself and his students."

ASCE Honorary Members

Two Americans, a German and a Mexican have been voted honorary membership—The American Society of Civil Engineers' highest distinction. They are:

Prof. Whitney C. Huntington, head of the department of civil engineering, University of Illinois.

Howard S. Morse, chairman of the board, Indianapolis Water Co.

Karl Imhoff, International leader in sanitary engineering, of Essen, Germany.

Lorenzo P. Castro, leading figure in the Mexican railroad field, of Mexico City.

Formal presentation will be made at the ASCE's annual meeting in New York City on Oct. 15.

Another Challenge

Air pollution controllers turn to radioactive gases for detection

As a nuclear-chemical economy displaces a combustion economy, concern about soot and fly ash would be replaced by concern over strontium-90 and radioactive meteorites, forecast Benjamin Linsky, outgoing president of the Air Pollution Control Association at the group's Golden Jubilee convention held in St. Louis June 2-6.

"The concern over the black smogs of London, St. Louis, Liege, Pittsburgh and Donora," said San Francisco engineer, "and the concern over the blue and mud colored smogs of every metropolis in the world will undoubtedly be cleared away, to be replaced by the concern over the electronically detectable, invisible clouds of radioactive gases and submicroscopic particles around the world and between the planets."

Concerning progress during the last half century, Mr. Linsky said actual achievement had lagged behind technical knowledge. He thought the greatest obstacle to clearing the air had been poor communication of information, much of it deliberate.

In another paper, organic solvents were described as second in importance only to automobile exhausts as a source of smog in the Los Angeles area. Robert G. Lunche, evaluation and planning engineer of the city's air pollution control district, said the principal sources of the solvents were plants making automobiles, aircraft, paint and varnish, cans and containers, pharmaceuticals and other products.

Milton Reisenstein, smoke abatement engineer for Baltimore, was elected president of APCA.

Water Pipeline to Huron Gets to Final Plan Stage

Their own water authority has recommended to two counties north of Detroit, that $116,000 be spent for detailed engineering plans for a 50 mile-plus pipeline to Lake Huron. This latest action comes on the heels of a preliminary survey by Bechtel International Pipeline Co. and a consultant's report to the six counties comprising greater Detroit recommending a central water system (ENR Apr. 4, p. 24).

The recommendation by the Southeastern Michigan Water Authority, comprising Oakland and Macomb counties, calls for Bechtel to prepare detailed plans for two 8 ft dia lines from Lake Huron into Avon Township in Oakland County which, with necessary pumps, could handle up to 300 mgd. Bechtel's first survey placed system cost at $70 million. The two counties would share the engineering cost, equally; early allocation of the monies is expected.

Meanwhile, Wayne County to the south of Detroit is going ahead on its own to construct a 150 mgd water supply drawn from the lower Detroit River. Thus, for the time being at least, peripheral counties are going their separate ways from the city of Detroit. On the other hand, two additional major sources of water are being developed to serve the Detroit metropolitan area, whereas under a central regional system the immediate construction probably would concentrate on expansion of the city of Detroit's existing system.

Storm Aftermath

Repair of damaged Florida turnpike section complete for $400,000

Completion of the $400,000 repaving of a damaged 11 mile section of the Sunshine State Parkway between Stuart and Fort Pierce has been announced by Thomas B. Manuel, chairman of the Florida State Turnpike Authority.

"All four lanes on both north and south bound roadways are in excellent shape and traffic is flowing normally over this section," Mr. Manuel reports.

The repaving was necessitated after heavy, unseasonal rains in February (ENR Mar. 21, p. 27).

The northbound lanes were closed for repaving and traffic was maintained over the southbound lanes in both directions. This procedure was reversed when preliminary repairs were made to the southbound road. Damaged portions of the road were removed, new base placed and then the asphaltic concrete top was put on in two layers.

Mr. Manuel makes no mention of the faulty "Belle Glade" rock that crumbled badly under heavy rains and apparently caused all the trouble. An engineering report issued May 9 by Howard, Needles, Tammen & Bergendoff, consultants had this to say:

"About the first of March, some pavement distress developed in the 11 mile section immediately north of the St. Lucie Canal. Prompt and exhaustive investigation into the cause of this failure was made and it was determined that moisture from excessive rains during the latter stages of the construction program and further augmented by heavy rains late in February had caused the limerock base to become plastic and unstable.

"Repeated traffic loads on this unstable section of base resulted in a breakdown of the asphaltic surface. The limerock for this section was taken from a source near Belle Glade at the south end of Lake Okeechobee and met the State Road Board standards and the Turnpike Authority standard specifications in every respect. It is, however, different from the Miami limerock that was used on the balance of the Parkway in that it has a much lower optimum moisture content and is much more susceptible to physical changes resulting from excessive moisture. When the surafec is repaired, an effective seal and a denser bituminous mix will be used to insure against repetition of water seepage into the rock base."

Belle Glade rock now has been banned on all primary roads in Florida.

It was never determined who gave the orders to pave the strip over the water-soaked rock.

First Concrete Is Placed For Corps' Ice Harbor Dam

Ice Harbor Dam construction reaches a key point as first concrete is placed for the $135 million project. And because daytime temperatures are holding to the 100 deg level, a "moonlight" concrete placing schedule has been started to prevent overheating of each day's pour in the curing process. During June, concreting will take place from 4:30 pm to 8 am; in July and August from 8 pm to 8 am.

The construction within the cofferdam is part of a $30 million contract with Montag-Halvorson-Austin and Associates for south shore construction of powerhouse, substructure, partial spillway, fishway and pumphouse.

The schedule calls for power production from the project to begin December, 1961. The 540,000 kw installation is being constructed under the jurisdiction of the Walla Walla district, Corps of Engineers.

The State Will Pay

North Carolina reduces share cities must pay for right-of-way costs

A new state law which provides that municipalities must pay only 20% of the costs of right-of-way acquisition for highways inside corporate limits instead of the present 33% has been passed by the North Carolina legislature. The bill also provides that on 90% federal government financed highway projects the municipalities need not pay any right-of-way costs.

The measure started as a local bill for sparsely populated Dare County, but the Senate amended it to make it a statewide measure and the House concurred.

Another bill that would tap the state's highway fund for financially-squeezed municipalities was passed by the House on June 4 and sent to the Senate. It provides for a rebate on all gasoline taxes paid by cities, towns and counties. The Highway Commission opposed the measure—it would take $350,000 a year out of the Highway Fund.

C. B. Wuertenberger, president of Rea Co., Charlotte, N. C., contractors on the section, commented: "The engineering firm gave us the date to start our work. We paved it when they told us."

There is still some shoulder work to be done, such as seeding and mulching. Shoulder erosion will continue to be a problem until the grass has formed a sod. Engineers estimate that 70% of the shoulders and slopes now have a good stand of grass.

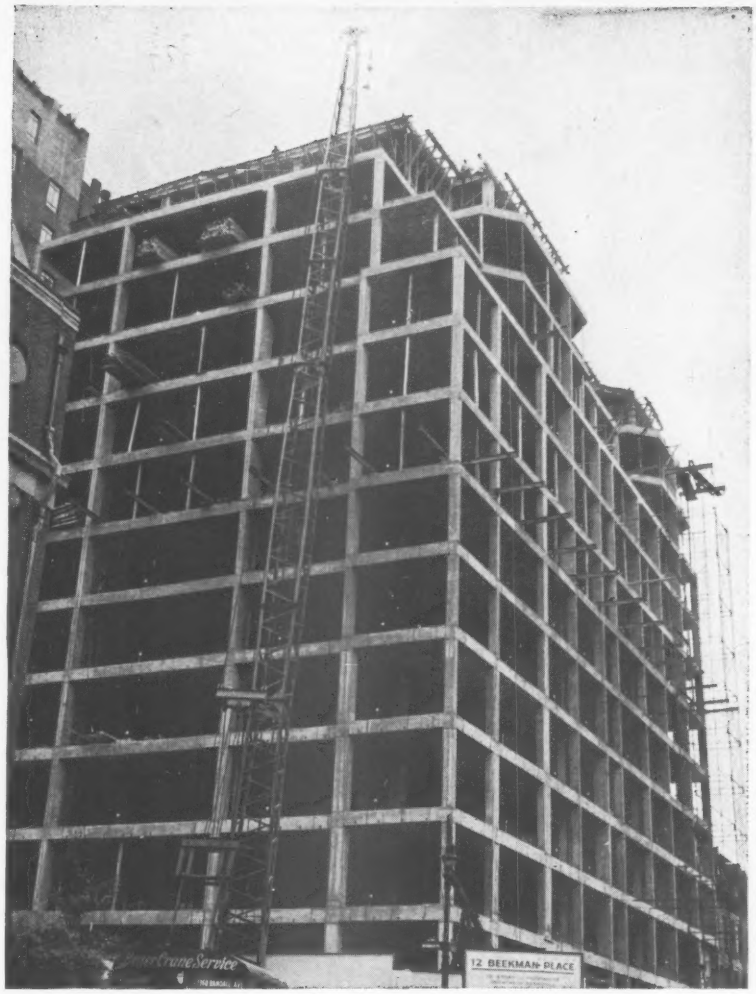
Denver's Dry Lawns Finally Get a Break

All watering restrictions have been lifted in Denver for the first time in three years. According to Hudson Moore, Jr., president of the Denver Water Board, an unprecedented amount of spring runoff from snows has filled mountain streams west of Denver to excess.

Mr. Moore however, points out that later this summer, after the heavy melting of snow is completed in the mountains, it may be necessary to put into effect some restrictions.

During the last three summers home owners have been restricted to about 10 hours of watering weekly for lawns and shrubs.

Restrictions were inaugurated three years ago when storage declined to 60,000 acre-ft compared with the Denver water system's 257,000 acre-ft capacity. The current runoff is building up storage to almost capacity, Mr. Moore reports.



Concreting: 14 Stories, 51 Days

Construction got off to a fast start on a 14 story luxury apartment house now rising in New York City. It took only 51 days to complete the reinforced concrete frame and floors.

Most of the floors, with a gross area of about 8,000 sq ft each, took only three days apiece. The first three floors, however, went more slowly.

Up to the 11th story, all floors have the same area. Upper floors, however, are set back.

The floors are flat-plate type, with beams only at spandrels and at elevator and stairway openings. The slab is 6½ in. thick, reinforced with an average of 5¼ lb of steel per sq ft. Each floor required 230 cu yd of concrete.

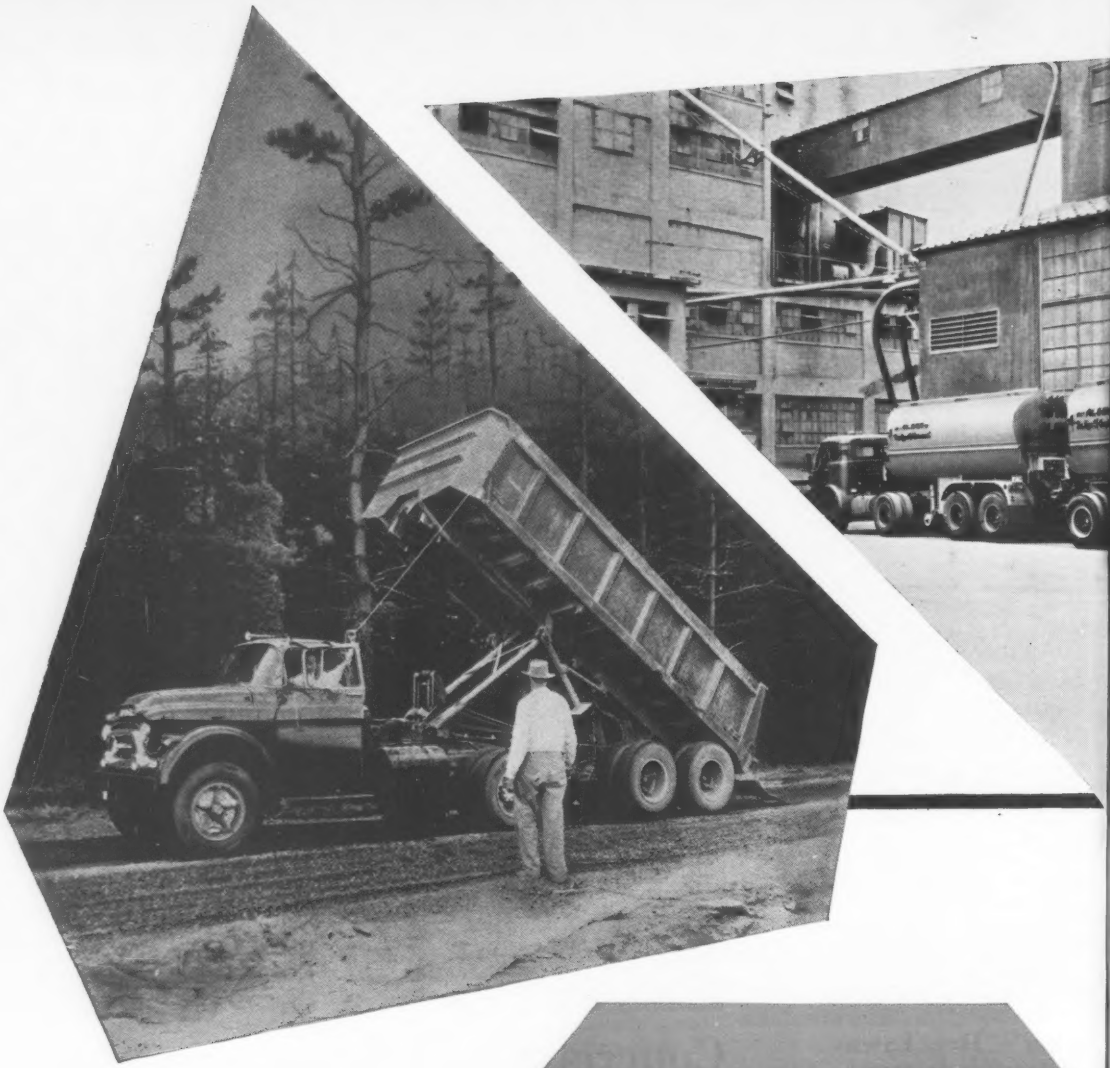
No special techniques were used. The rapid progress was due entirely to good coordination. Most of the concrete was placed directly in the forms by crane and bucket; hopper-loaded wheelbarrows took care of hard-to-reach spots.

Excavation began early last spring on the 10,500 sq ft Beekman Place site, which was formerly occupied by brownstone residences. Occupancy of the new apartments is scheduled for next February.

With a total of 280 rooms, the building will have 70 two-room to five-room apartments, including four duplex units. It will be completely air-conditioned. The project will be known as 12 Beekman Place.

The exterior wall finish will be tapestry brick, with a first-floor facade of limestone. Windows will be aluminum-framed double-hung type.

Joseph P. Blitz, Inc., is the owner-builder of the project. James L. Gerrie is the Blitz project manager. Dic Concrete Corp. was the concrete subcontractor. H. I. Feldman is the architect and Robert Rosenwasser the consulting structural engineer. All are of new York City.



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The Geo. F. Alger Co., Detroit, has speeded up cement delivery to a matter of 27 minutes for 170 barrels, and reduced manpower needed from 4 to 1, with Fruehauf Twin-Screw Bulk Commodity Tanks.

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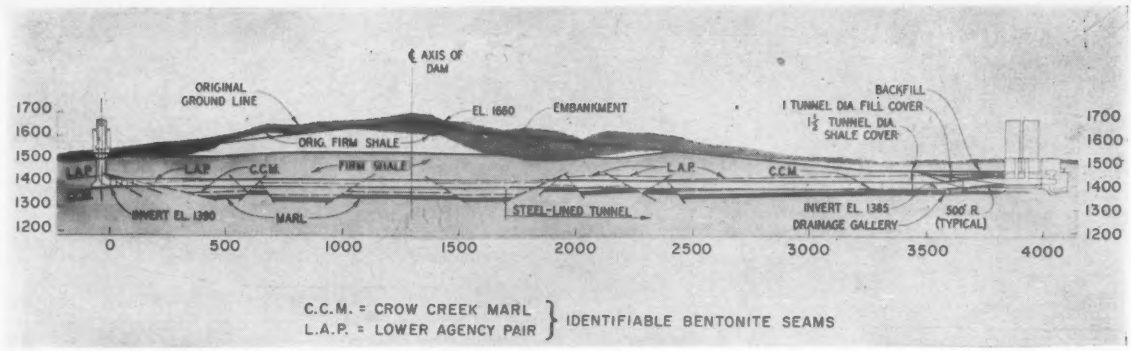


PROFILE of Tunnel No. 7 indicates need for low level pressure tunnels at slide-plagued Oahe Dam.

Oahe Power Tunnels to Be Inverted Siphons

Approval of an unusual design for the power tunnels of Oahe Dam on the Missouri River has set the stage for work totaling nearly $150 million.

The go-ahead came when the Oahe Board of Consultants approved the Corps of Engineers Omaha District's plans to utilize inverted siphons for the power tunnels.

The design is the result of landslides that have plagued work on the dam (ENR Oct. 11, 1956, p. 40). The tricky Pierre shale formation, cracked by faults and slippery with bentonite layers, began sliding in December 1955. Remedying the slides necessitated removal of an extra 7 million cu yd of shale under the Stage 4 earthwork contract of Western Contracting Corporation of Sioux City, Iowa. Original slopes were flattened from 1 on 6 in the powerhouse excavation area to 1 on 9, and other excavation was carried out to prevent future slides.

• **Tunnels in same material**—Because it has been planned to run the tunnels through the same type of material that gave way, occurrence of the slides prompted a search for a more desirable location. Six plans were studied. They included alternate locations on the left bank, running the tunnels back in the undisturbed hills, moving them to the right bank, taking them through the center embankment of the dam itself and dropping them deep into the ground.

The very deep plan that has been adopted drops the tunnels from the Oacoma Zone of the Pierre shale down into an area just above the Crow Creek marl that is firmer and less broken and seamed.

Access to the tunnels will be through drop inlets at the upstream toe of the dam. Each inlet will be 134 ft deep and lined to 30 ft dia. Bottom of the inlet shafts will turn 90 deg through reducing elbows into 24 ft dia tunnels.

The tunnels, mined to 29 ft dia, will vary in length from 3,100 to 3,800 ft. Their courses under the dam will be determined by the firmest shale; as a result they will not all be parallel and none will be straight.

An enlarged and improved continuous mining machine like the 72 ft long "Mittry Mole" pioneered in the flood control tunnels at Oahe (ENR Dec. 2, 1954, p. 24) is expected to drill the tunnel. To permit its use, the drop inlets will be left unconcreted temporarily to provide room for the machine to be maneuvered around the 90 deg bend. Changes of horizontal direction of the tunnels will be on sweeping curves, allowing the mining machine to operate all the way.

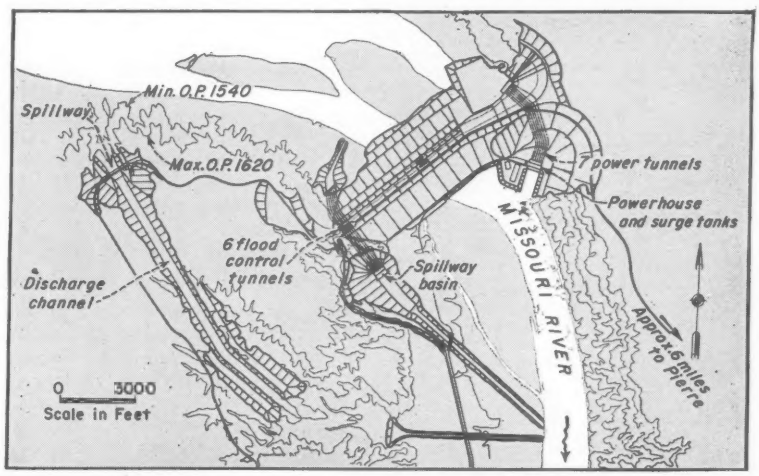
• **Other design features**—The change in power tunnel design caused abandonment of an original scheme to locate control gates in shafts midway through the tunnels and near the dam's axis. Instead, towers 145 ft high will be constructed atop the drop inlets. They will house cylindrical gates similar to those used at Hoover Dam. The gates will be 32 ft in dia and 12 ft high.

Only the downstream half of the tunnels will be steel lined, and the liner will be cast into concrete rather than separated by an annular air space as are the tunnels, for example, at Fort Randall Dam.

A small drainage tunnel, 7 ft in dia, will also be drilled parallel to the main tunnels. Reaching out perpendicularly from it will be horizontal drains through the area of the dam in which the steel-lined portion of the power tunnels are located.

Because of favorable experience with humidity control in driving the right bank flood control tunnels, time restrictions will be eased in follow-up concreting after the shale is exposed by tunneling operations. On the right bank, specifications required that the shale be exposed no longer than 30

(*Continued on page 34*)



APPROVED LOCATION and design of power tunnels have set stage for $150 million of contracts over next two years. Work to be let this summer totals $50 million.

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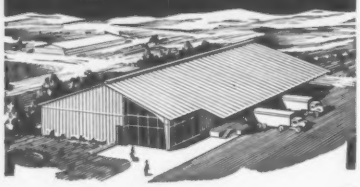

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days. This later was eased to 60 days. The new specifications will permit the shale to be exposed 100 days.

• **Way cleared for bids**—With the design agreed to, Army Engineers will advertise four jobs this summer which total some $50 million, as follows:

• July—Seven generators, 85,000 kw each, estimated at $18 million.

• July—Power intake substructures and upstream tunnels, estimated between $12 and $16 million. Work includes 7 shafts, 42 to 48 ft in dia and 140 ft deep, and the upstream tunnels, mined to 29 ft dia and 9,000 ft in combined length.

• August—Earthwork Stage 6, involving 22 million cu yd and $10 to $13 million. The job includes diversion and closure, scheduled for the summer of 1958.

• September—Powerhouse substructure, expected to run $4 to $6 million involving 85,000 cu yd of concrete

Other jobs to come up for bid in the next two years, all of them put in the mill by the decision on the tunnels, are these:

• Drilling lined halves of power tunnels, totaling 15,000 lin ft, estimated between $30 and $40 million.

• Surge tank bases, $12 to $15 million.

• Completion of powerhouse, $12 to $15 million.

• Surge tank and penstocks, $15 to $18 million.

• Control towers, $7 to $10 million.

Additional powerhouse equipment, $5 to $7 million.

Oahe, which will be world's largest compacted earth dam, is a project of the Omaha District office headed by Col. Thomas J. Hayes. Jerome O. Ackerman and Edward Soucek head the design forces; John Sibert, Jr., is the area engineer.

Members of the Board of Consultants are H. H. Roberts of the Missouri River Division office; Arthur Casagrande, Harvard University; Sinclair O. Harper, former chief engineer of the Bureau of Reclamation; Roy Carlson of Berkeley, Calif.; Hibbert M. Hill, chief engineer of Northern States Power Co., Minneapolis, and E. B. Burwell, former principal geologist of the Corps.

Indians Sat and Waited—Then Built Dam in Secret

Indians have won a skirmish with the Salt River Valley Water Users Association in Arizona. Whether they have won the entire battle will be determined by subsequent legal warfare.

What the White Mountain Apache Tribal Council did was build a dam—in secret—after having been blocked by earlier legal action. The dam is in the Smith Park area, bottling Trout Creek for what will be a 250 acre lake, which the Indians want to convert into a fishing and resort facility.

When the project was first proposed, the association objected, claiming it had jurisdiction over the water on behalf of its members. And after the Indians would not go along with its conditions for impoundment, the Water Users obtained a Superior Court injunction which stopped the project.

The Indians waited until the issue had quieted down, then closed the area to visitors, gathered heavy machinery and started on the dam with tribal labor.

Housing Project Slated For Plattsburg Air Base

The largest Air Force family housing project in the country was started last week at the Air Force Base in Plattsburg, N. Y. The $27.5 million project will consist of 1,685 units contained in 396 buildings. Construction costs will be financed by the Chemical Corn Exchange Bank Trust Co. of New York under provisions of the National Housing Act.

The housing accommodations are expected to relieve a shortage of suitable housing, which has prevented the planned expansion of the base for some years.

Kelly & Gruzen, New York City, are the architects and engineers. S. S. Silberblatt, Inc., New York contractors, expect construction to be completed in two years.

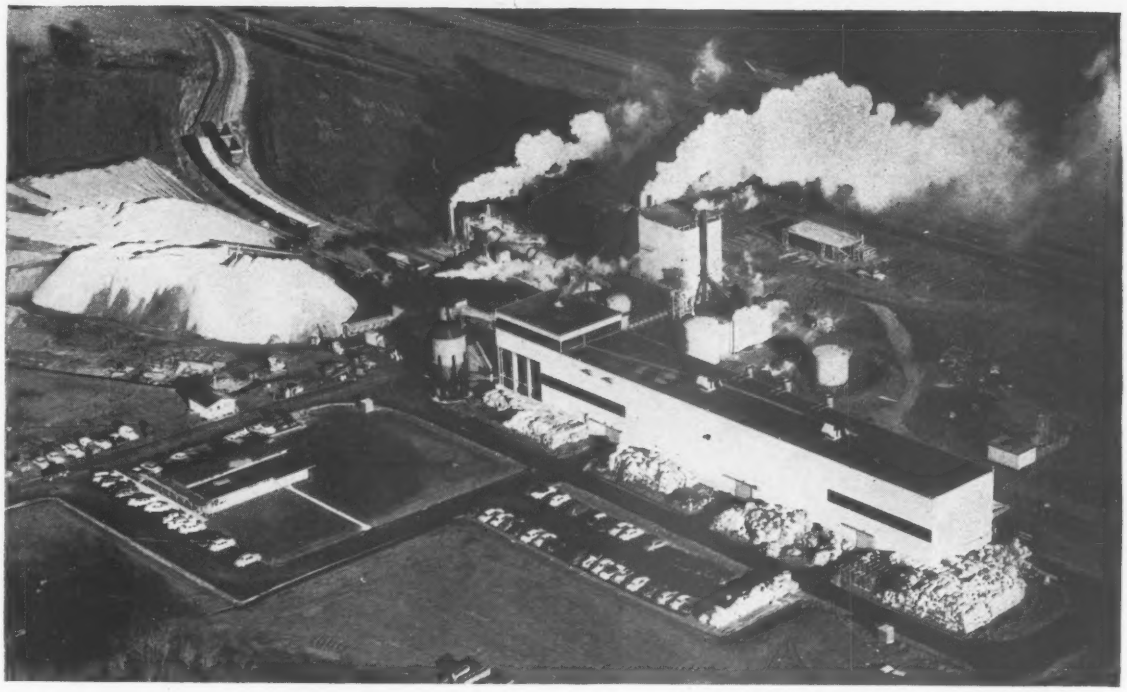
Water Agency Pushes Electronics, Research

Two recent actions by the Philadelphia Water Department reflect the growing interest of municipal water and sewerage agencies in automatic controls and do-it-yourself research.

After announcing that his department is writing specifications for a $200,000 electronic telemetering system (planned for some time), Commissioner Samuel S. Baxter revealed that the city civil service commission has authorized a position within the water department of computer systems engineer, paying $8,719 to $9,551. The incumbent will aid in the design of a supervisory control system to be integrated with the telemetering system, thus providing remote push button control over Philadelphia's water system for such as valves and pumps.

Commissioner Baxter also is in process of setting up a separate research and development division within his water and sewerage agency. This is in recognition of many unsolved technical operating problems and the obligation of a large water operator to contribute to the furtherance of the profession.

At this new Western Kraft plant...



Consulting Engineers and Architects: SANDWELL & COMPANY, Vancouver, B. C.
General Contractor: HOFFMAN CONSTRUCTION CO., Portland, Ore.
Mechanical Contractor: HOFFMAN ENGINEERING CO., Portland, Ore.
Plumbing Contractor: VERN COLLINS PLUMBING CO., Salem, Ore.

—as in the selection of a plant site, efficiency determined the choice of

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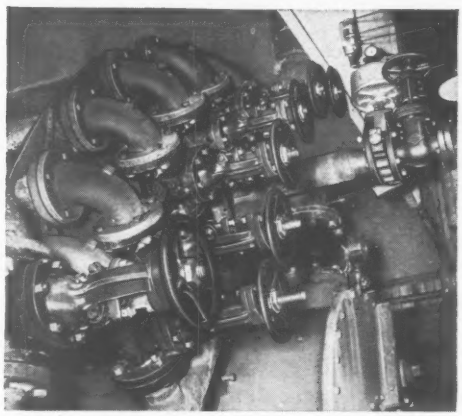
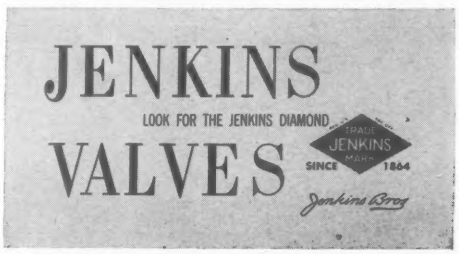


Manifold of Jenkins Nickel Iron Gate Valves on the liquor washers controlling the showers.



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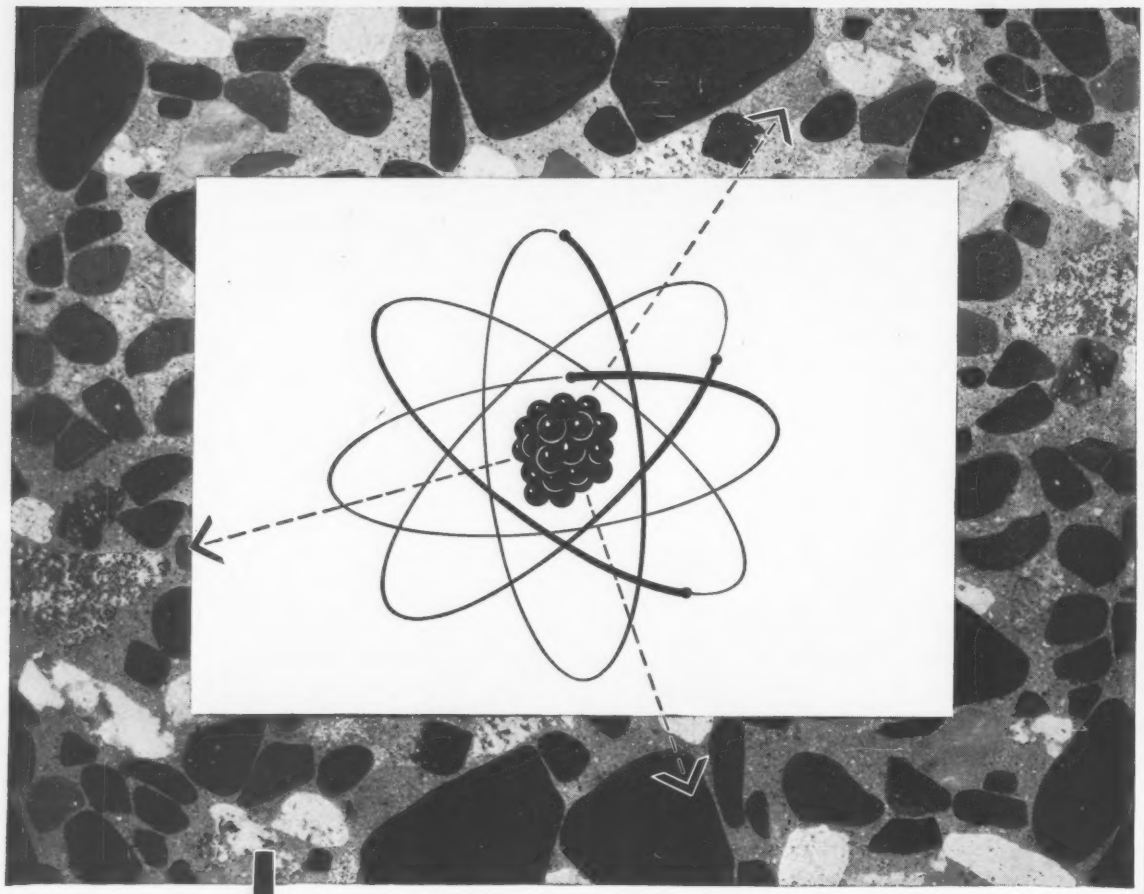

"heavy" concrete for reactor shields

High-density concrete, an efficient and practical radiation shielding material, is destined for wide use in nuclear reactors.

The high density results from the use of heavyweight aggregates and affords 1½ to 2 times more radiation protection than normal weight concrete of equal thickness. Its higher unit cost is offset by overall cost savings, which on one project amounted to $7,000,000!

INTRUSION-PREPAKT materials and methods are a proved solution for placing high-density concrete in massive, complex shields having a maze of obstructions. High-density aggregates are carefully preplaced to assure uniform density without segregation. Consolidation with INTRUSION grout produces a PREPAKT concrete structure free of radiation leaks. Densities to 300 lbs./cu. ft. and over can be achieved, usually at less cost than by conventional methods.

INTRUSION-PREPAKT experience in placing high-density concrete reactor shields qualifies it as the top organization to work with on such projects. You will deal with a firm that *specializes* in concrete construction and maintenance, *has* a complete field construction group and *offers* an engineering design service. For information, write: INTRUSION-PREPAKT, Inc., Room 568-G, Union Commerce Bldg., Cleveland 14, Ohio. In Canada: INTRUSION-PREPAKT, Ltd., 159 Bay St., Toronto, Ontario.

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Tallest Concrete Building in U. S.

Foundation work is under way for a tall, narrow apartment building in downtown Chicago that contains a number of bold and unique design and construction features.

Located just north of the Loop on Wacker Drive between State St. and Michigan Ave., the 40 story building will rise to a height of 365 ft above ground level. It will be Chicago's tallest reinforced concrete building and is believed to be the tallest such structure in the United States.

Compared to the tallest concrete buildings in South America and Europe, the new structure will not be quite so impressive. Argentina boasts a reinforced concrete building 470 ft high (ENR Feb. 7, 1957, p. 89); two in Madrid, Spain, are in the neighborhood of 400 ft high (ENR June 16, 1955, p. 36); and one in Sao Paulo, Brazil, still holds the world's record of 507 ft (ENR Sept. 2, 1948, p. 72).

• **Shear walls**—But height alone is only one of the several noteworthy features of the $6 million building that will overlook the Chicago River. Shear walls will extend across the narrow width of the 60x150 ft building to resist wind stresses; caissons are being excavated by a hydraulic rig, new to this country; and 75% of the 446 apartments will each have its own balcony.

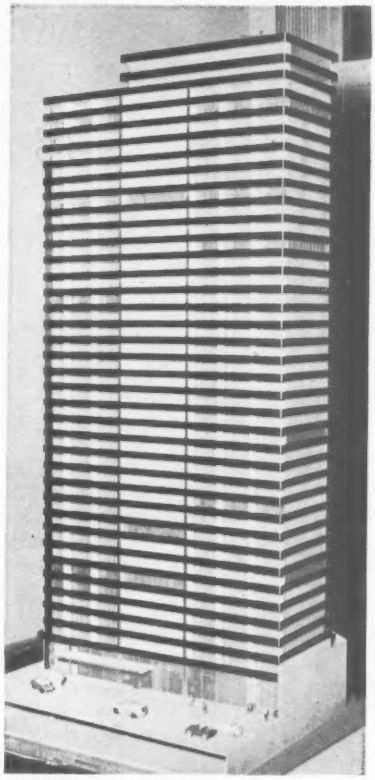
According to the design plans, there are four basic lines of shear walls at 40 ft c-c. They extend completely across the 60 ft width, except for a central lengthwise corridor.

There are 14 apartments per floor—four between each pair of shear walls and one extending full-width across each end. Column spacings, based on a basic 4 ft building module, are 8 ft and 16 ft transversely and 20 ft longitudinally. Columns, in general, will be 20 x 60 in., with the long dimension parallel to the narrow width of the building.

Below the sixth floor each transverse column line contains a rigid bent of reinforced concrete, which extends on down to the foundations.

• **Caissons to bedrock**—The 57 caissons supporting the 40 story apartment building will extend to bedrock at El. 110—about 120 ft below ground line. They will be keyed into the bedrock 2 or 3 ft, and tied together at their tops with a crisscross system of grade beams for added stability and rigidity.

• **No basement**—There will be no basement, chiefly to avoid groundwater problems from the Chicago River, just on the other side of Wacker Drive.



SKYSCRAPER MODEL displays an exterior blended of glass and stainless steel.

First floor level will be at the lower level of Wacker Drive. Parking for 203 cars will be provided on the first and second floors, and on the third, fourth and fifth floor levels at the rear of the building.

The third floor, at the upper level of Wacker Drive, will contain the main lobby, two or three shops, offices of the building and a large restaurant. The fourth and fifth floors will be devoted to service facilities and parking accommodations.

• **32 floors of apartments**—There will be a total of 446 apartments containing 1,216 rooms. Only 12 apartments will be located on the sixth floor, the remaining area being devoted to laundry facilities for the occupants of the building.

Each floor from the 7th to the 37th, inclusive, will contain 14 apartments. The 38th floor will be a cocktail lounge; the 39th floor, an observation deck; with a 100 x 60-ft helicopter landing area at the 40th floor level. Stairs will connect this area with the observation and cocktail floors.

• **Private balconies**—Nearly three-fourths of the apartments will have private balconies, 6½ ft wide by 20 ft long.

The four central apartments on each floor have no balconies, but are located with their exterior walls set flush with the building lines. This arrangement provides space for four elevators on one side of the corridor, and stairwells, storage areas and ducts for service facilities on the opposite side.

• **Curtain wall construction**—The building will be sheathed in stainless steel and glass. Bands of stainless steel 4 ft high will encircle the building as the exterior trim. In the central area where there are no balconies, sliding windows will be located above the steel bands.

For the remainder of the building the steel-faced curtain wall construction will form the parapets for the balconies. Sliding glass doors extending from floor to ceiling will separate the balconies from the living quarters.

The insulated stainless steel curtain wall will have a total thickness of 1 in., including sheet-steel backing, with an additional ¾ in. for metal lath and plaster. Tests show that it will have a heat-transfer factor (U) of 0.25; comparable in insulation to a conventional 12 in. brick wall with plaster.

Translucent, shadowproof dividers will separate adjoining balconies, for privacy, yet let some light filter through.

• **8-ft ceilings**—Clear ceiling height will be 8 ft, with a floor-to-floor height of 8 ft 10½ in. The floors will be carried on flat beams, 10½ in. deep, to match the total depth of floor and provide smooth ceilings. The floor will be 2½ in. of poured concrete on 8 in. of lightweight precast concrete block.

Floor finishes will vary. Vinyl plastic will be used in kitchens, closets and bathrooms, while some floors will be finished concrete to receive carpeting.

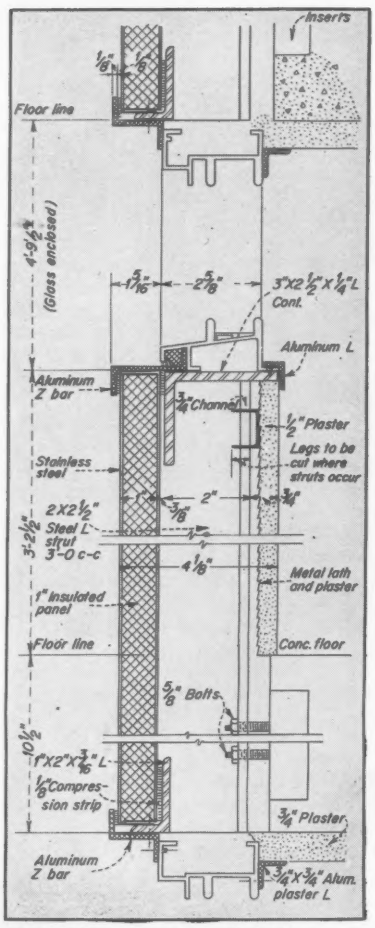
The apartment building will use a combined heating and air conditioning system, with the air conditioning being furnished by chilled water. Water for air conditioning will be supplied from the nearby Chicago River.

• **High-strength concrete**—In designing the building, high-strength concrete of 5,000 psi compressive strength at 28 days was specified for the caissons and up to the 17th floor. Above that level 3,000 psi concrete will be used. A total of 16,000 cu yd of concrete will be required.

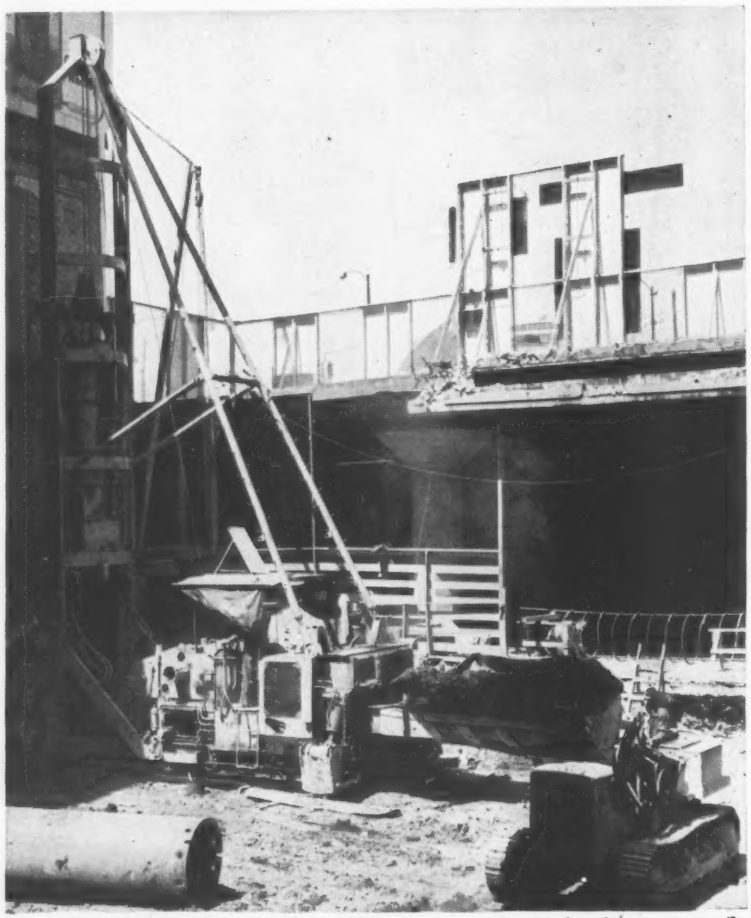
Main reinforcing will be rail steel, with an allowable working stress of 20,000 psi.

(*Continued on page 40*)

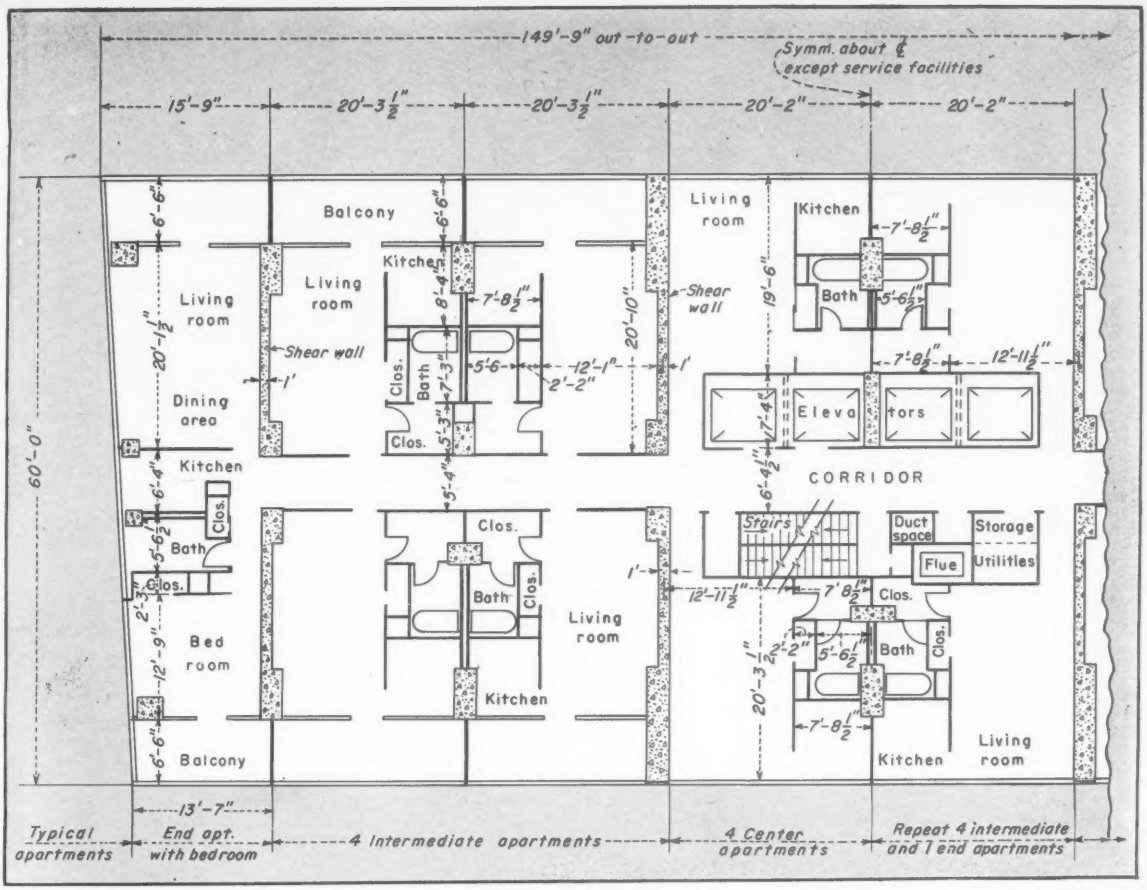
HYDRAULIC RIG sinks 39 in. dia steel casings (left) 115 ft to bedrock, excavates enclosed material by grab bucket, pours transit-mix concrete (right) to form caisson while extracting the sections of casings . . . in a record time of 17 hr.



INSULATED curtain wall detail.



IN CLOSE QUARTERS, rig sinks hole for caisson. Tractor-shovel removes spoil.



PARTIAL FLOOR PLAN shows typical apartment layouts. There will be fourteen apartments per floor.

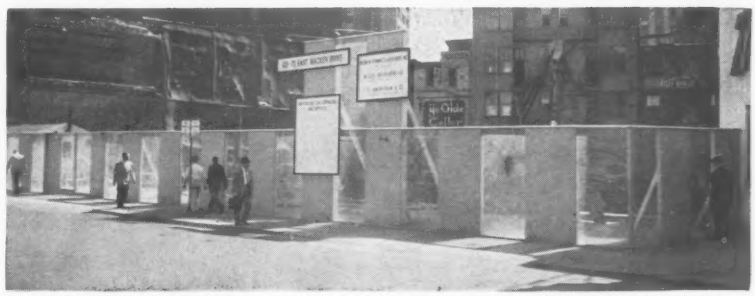
• **Caisson construction**—Excavation and site-clearing was started January 25, and caisson construction got under way Feb. 25, with all 57 caissons scheduled to be completed in 90 days.

The 39 in. dia concrete caissons were "drilled-in" and "concreted" with a hydraulically operated machine, developed in France and introduced in this country only recently (ENR, Mar. 14, 1957, p. 69). Here's how it works:

First, the self-contained rig excavates a 39 in. dia hole to bedrock, with a grab-bucket operating inside of heavy steel casings which are sunk progressively under hydraulic pressure. Each 20 ft length of casing, made of 1⅜-in. steel plate, weighs about 1,400 lb.

Sections of casing are bolted together end-to-end as they are sunk to bedrock and about 2 ft into it. Next, the bottom of the hole is inspected, ready to receive concrete to form the caisson. Ready-mix concrete is delivered to the site in 11 cu yd transit mix trucks—one such load producing about 35 ft of 39 in. dia caisson.

As the placing of concrete progresses, the steel casing is retracted by hydraulic lift. Sections are removed and cleaned, ready for reuse. A steel cage made of eighteen 1¼ in. reinforcing bars 15 ft long is embedded in the top of each caisson to tie it into grade beams supporting the building columns.



SIDEWALK SUPERINTENDENTS get unobstructed view of construction operations through wide transparent plastic panels, between timber framing.

Progress has been steady without especially attempting to set any records. However, a 39 in. dia hole has been excavated 115 ft to bedrock in as little as 11¼ hr. The best time made in pouring concrete for a caisson is 2¼ hr; while the best total time of excavating for, and concreting, a single caisson is 17 hr. This included moving the rig into position, leveling it up, excavating and sinking the casing, placing the concrete, extracting and dismantling the sections of casing, and setting the cage.

• **Designers and constructors**—Milton M. Schwartz & Associates, Inc., is the architect for the $6 million building. Karl T. Brusa is project engineer. Structural designs were prepared by Miller Engineering Co. C. A. Tharnstrom & Co. is the general contractor, and Otto Roos is construction superintendent. The caisson construction is being performed by the Lake States Engineering Corp., with Edward J. Archibald as construction superintendent.

NEW ENGLAND'S GATEWAY to the west is the entrance to the New York Thruway's Berkshire link as seen from the newly opened gates at the Massachusetts Turnpike.

EXCAVATIONS are being made for pier fo[w bridg]dations on the Hudson River's east bank for [the N]

Berkshire Link—New England's Route to

With earthmoving machinery rolling along the scenic Berkshire countryside, the 24 mile Berkshire Section of the New York Thruway will finally become a reality by the end of 1958.

The missing east-west link—as it can properly be called—costing more than $52.9 million, is the highway that truckers plying between New England and the West have been clamoring for, a safe easy-graded Thruway-style road with wide lanes and center malls.

The new road will begin at the main stem of the Thruway about eight miles south of Albany. From this connection it will extend easterly, across the Hudson River on a new bridge, to the Massachusetts State Line to connect with the recently opened 123 mile Massachusetts Turnpike, leading into the Boston metropolitan area (ENR July 12, 1956, p. 26).

A motorist going north or south in Eastern New York State can now find excellent roads. On the west side of the Hudson River there is the Thruway itself, on the east side, at least five major parallel routes.

But for the traveler going from west to east, or from Boston to Albany and points west, there exist only tortuous, narrow, obsolete roads, congested with heavy trucking and laid out on continuous curves through fully developed areas all along the right-of-way. Many east-west drivers prefer the longer but safer drive south to New York City and then north again so as to avoid the agonizing and hazardous Routes 20 and 203.

• **Specifications**—Generally, the new connection will be a four-lane, reinforced concrete highway, with a mall ranging up to 800 ft in width.

For future expansion, all the four-lane sections are so designed that an additional two lanes may be built without acquiring additional right-of-way or reducing the mall to less than 20 ft.

The four lane sections will be 25 ft wide with a 12 ft right-hand lane and a 13 ft left-hand lane, for safer and easier passing.

Shoulders are to be stabilized so that vehicles (including heavy trucks) may be parked in the event of motor trouble or other emergency.

At all four exit and entry locations and two service areas there will be acceleration and deceleration lanes, about 1,200 ft long. Sight distance of at least 1,000 ft is provided.

• **Bridge starts**—With the driving of steel sheathing and piles for the pier foundations, the $20 million bridge

pier fo
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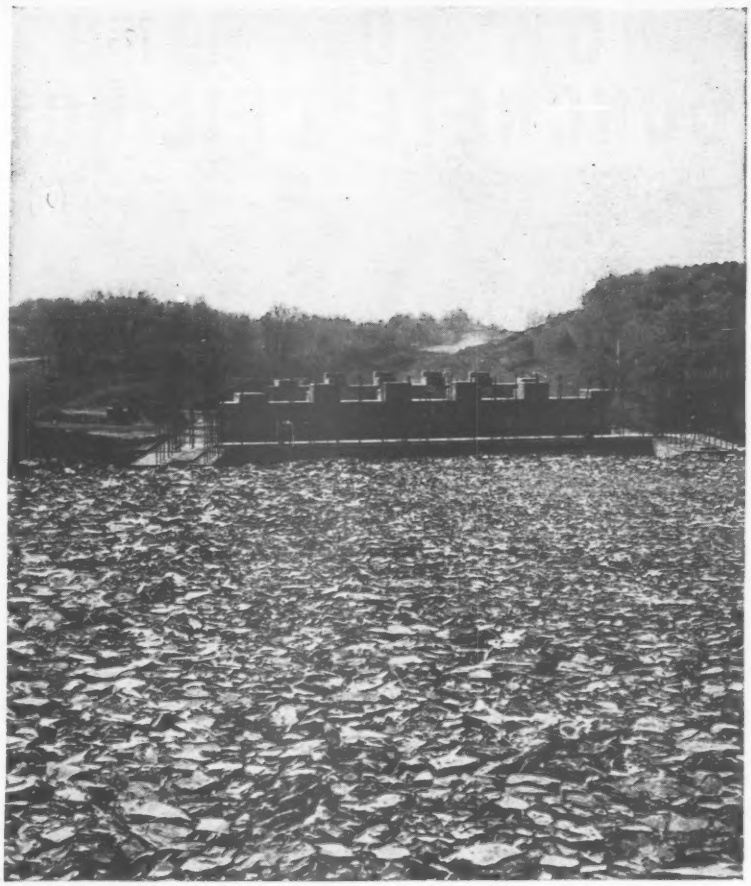
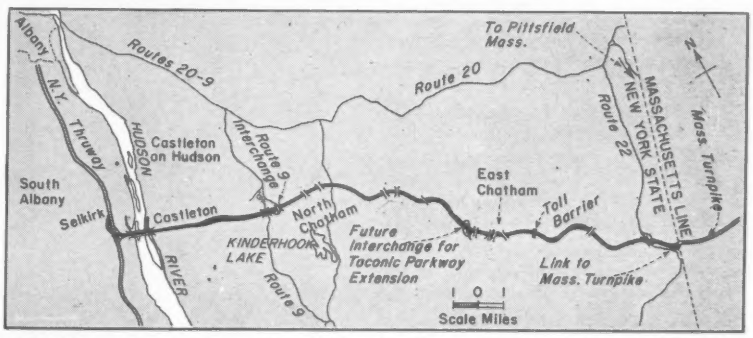
w bridge which will be located 400 ft north the New York Central Railroad Bridge.



CRUSHED STONE has been rolled on the Berkshire Section's right-of-way to form the superhighway's road bed, near the U. S. Route 9 interchange.

ute to the West



THE LINK in the traveling chain reaches 24 miles to connect the Massachusetts Turnpike with New York's Thruway.

construction is now underway. The A. A. Johnson Corporation and Peter Kiewit Sons Company, New York City, are doing the substructure work for $5,767,495 and Harris Structural Steel of New York, will do the steel work for $8,572,150. Additional contracts will cover the pavement, lighting and miscellaneous work.

The new bridge, spanning the Hudson River from Selkirk to Castleton, will be 5,330 ft long and will be of a type similar to the Tappan Zee Bridge at Tarrytown (ENR April 14, 1955, p. 44 and June 23, 1955, p. 34).

The main structure will consist of a three-span continuous truss with a vertical clearance of 135 ft over the 360 ft wide river channel. The truss will have a 600 ft center span with two 420½ ft side spans, while the approaches on either side will be a series of steel deck girders totaling some 3,889 ft in length.

The bridge's two roadways will each be 25 ft wide—two lanes in each direction—separated by a 13 ft mall.

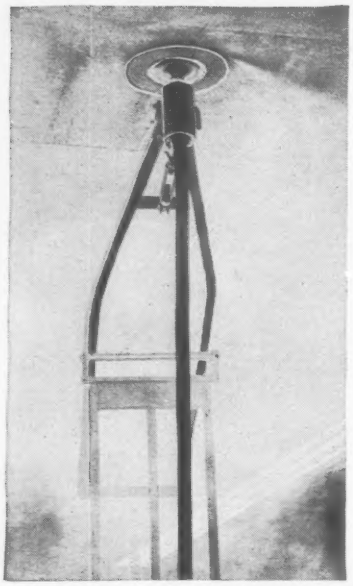
At present only substructure work is being done. The major portion of activity is for the pier foundations on the east and west banks.

A mid-stream island at the bridge site will help speed the contractor's work since most of the piers can be constructed with land-based equipment.

At both ends, reinforced concrete abutments rise out of the high sides of the steeply sloping terrain that edges the river valley. Surcharge for the east approach roads, as well as fill material to be placed behind the concrete abutment, has already been brought on location. Forming for the pier foundations on the east slope, adjacent to the abutment, has also been started.

Closer to the water, steel sheathing has been driven, forming cofferdams

HOW TO GRIND CONCRETE CEILINGS



FOG OF CONCRETE DUST

More and more building specifications require finely finished concrete ceilings. Because of this new requirement, Stow Manufacturing Company has developed the Stow CG Ceiling Grinder—a special machine designed to grind off form marks and fins, cut off nails and smooth the entire surface.

With this machine, one man can average 4,000 square feet per day. Simple to operate, it pushes along like a baby carriage.

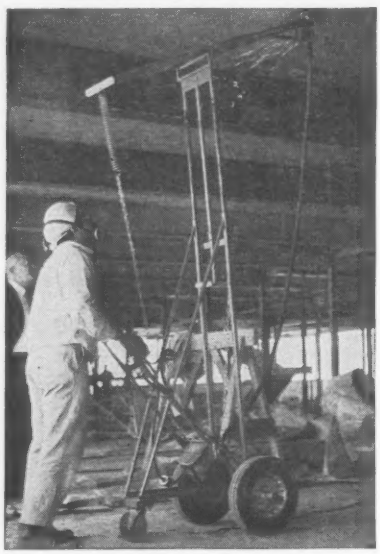
To operate the Stow Ceiling Grinder: (A) The operator first sets the pivot arm at about a 45° angle. He then adjusts the grinding disc to proper height by lifting up on the rubber-gripped handle in the center. A ratchet arrangement automatically locks it in position at the height desired. (B) A slight pressure is exerted on the grinding disc by the spring and chain assembly at the opposite end of the pivot arm. (C) A turnbuckle is used to get the most desirable angle for grinding. For ordinary grinding the disc should be flat against the ceiling, but for cutting nails and removing fins it works better at a slight angle. A spring arrangement is built into the bearing housing to support the grinding disc and absorb any shocks, thus preventing any gouging. Once the machine is adjusted, the operator just pushes it along.

The Model CG-10 Ceiling Grinder is used to grind ceilings from 8 to 10' high.

The Model CG-13 is used on ceilings from 10 to 13' high. Both models have a 1 HP totally enclosed motor operating at 3450 RPM. The disc is a 9" Bayflex of cotton fibrous material with a silicon carbide abrasive bonded with resin.

The Stow CG Ceiling Grinder can also be used for grinding walls. For this type work, employ the same flexible shaft as used on the ceilings but attach a handpiece or anglehead to one end.

Stow Manufacturing Company also makes a complete line of portable electric flexible shaft grinders for both wet rubbing and dry grinding walls. For more information on the Stow CG Ceiling Grinder and a copy of Stow's Grinding Concrete pamphlet, which gives the proper speeds for both wet rubbing and dry grinding, contact your Stow distributor or send in the coupon below. Stow Manufacturing Company, Binghamton, N. Y., also makes a complete line of concrete vibrators, rotary trowels and screeds.



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. . . Berkshire link

and excavation continues. Dewatering has been required.

• **Contract sections**—The construction awards were divided into five contract sections to speed work. Lane Construction Corp, Meriden, Connecticut, holds three of these sections, comprising about 11 miles, for a total of more than $17.2 million. These are the one-mile stretch from the main Thruway to the Hudson River crossing, the three miles from U.S. Route 9 to the Rensselaer-Columbia County line and the seven mile stretch located between the Rensselaer-Columbia County line to the County Road No. 27.

These sections include 16 structures carrying local roads and streams over or under the Thruway, and two major interchanges—one future connection to the proposed Taconic Parkway Extension (yet to be built) and the other with U.S. Route 9.

Considerable road work has been done in the Selkirk area and in the section near Route 9. Subgrades have already been levelled and covered with crushed rock, and the road-bed is being rolled to the required compaction. The reinforced concrete abutments for the Route 9 overpasses on both east and west-bound roadways have been completed with the exception of the abutment wings. The beam pads are ready to receive the steel.

In the Taconic Parkway Extension area, little if any work is being done since the contract for this section was only recently awarded.

The easterly 7.4 mile section, to the Massachusetts state line, is being built by Union Building and Construction Corporation of Passaic, N. J., for more than $7.1 million.

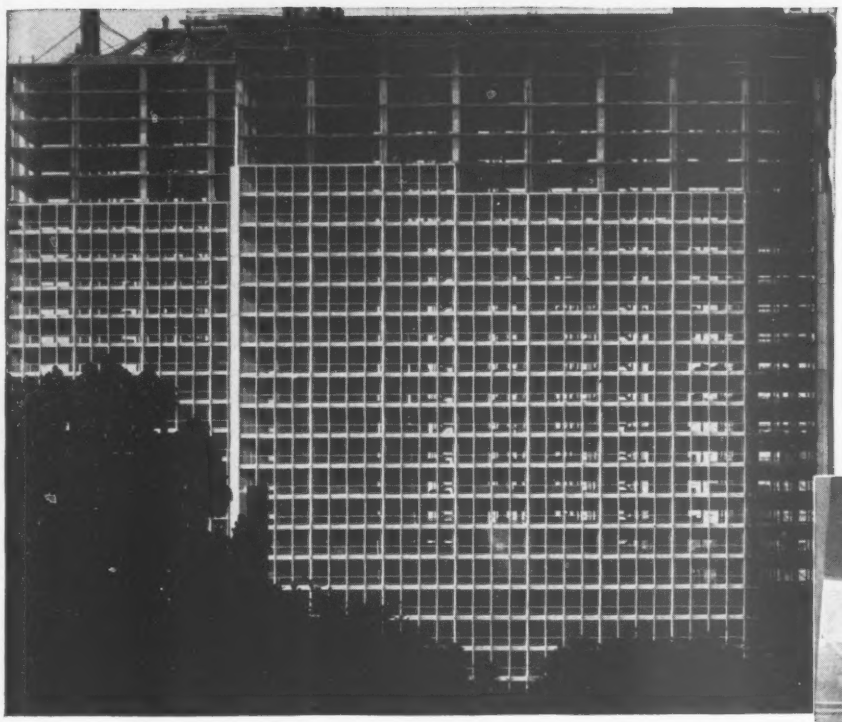
A vast earthwork operation is the major phase of this contract. Scrapers, carryalls and dozers are plowing the right-of-way into a rough graded dual highway, moving 2,662,000 cu yd of material. The work includes some rock excavation, west of the third interchange, where Route 22 crosses the Thruway near the Massachusetts Line. East of the same interchange, a swamp section is being filled with the suitable excavated materials.

At the state border, the Massachusetts Turnpike link joining this section is completed.

Grandview Construction Corp., of Mount Vernon, is building the east approach to the Hudson River Bridge for approximately $3.9 million.

Representing the New York State Thruway Authority are the consulting engineering firms of Madigan-Hyland, New York, Deleuw, Cather and Company, Chicago, and Andrews, Clark and Buckley, New York.

MASONITE



Concrete Form

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Associate Architect: Friedman, Alschuler & Sincere

Builders: Herbert S. Greenwald and Samuel N. Katzin

General Contractor: Sumner-Solitt Co.

Concrete Slab Form Work by: Adjustable Forms, Inc., Minneapolis, Minn.

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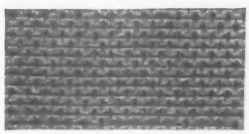

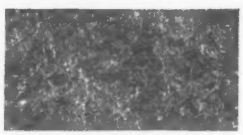

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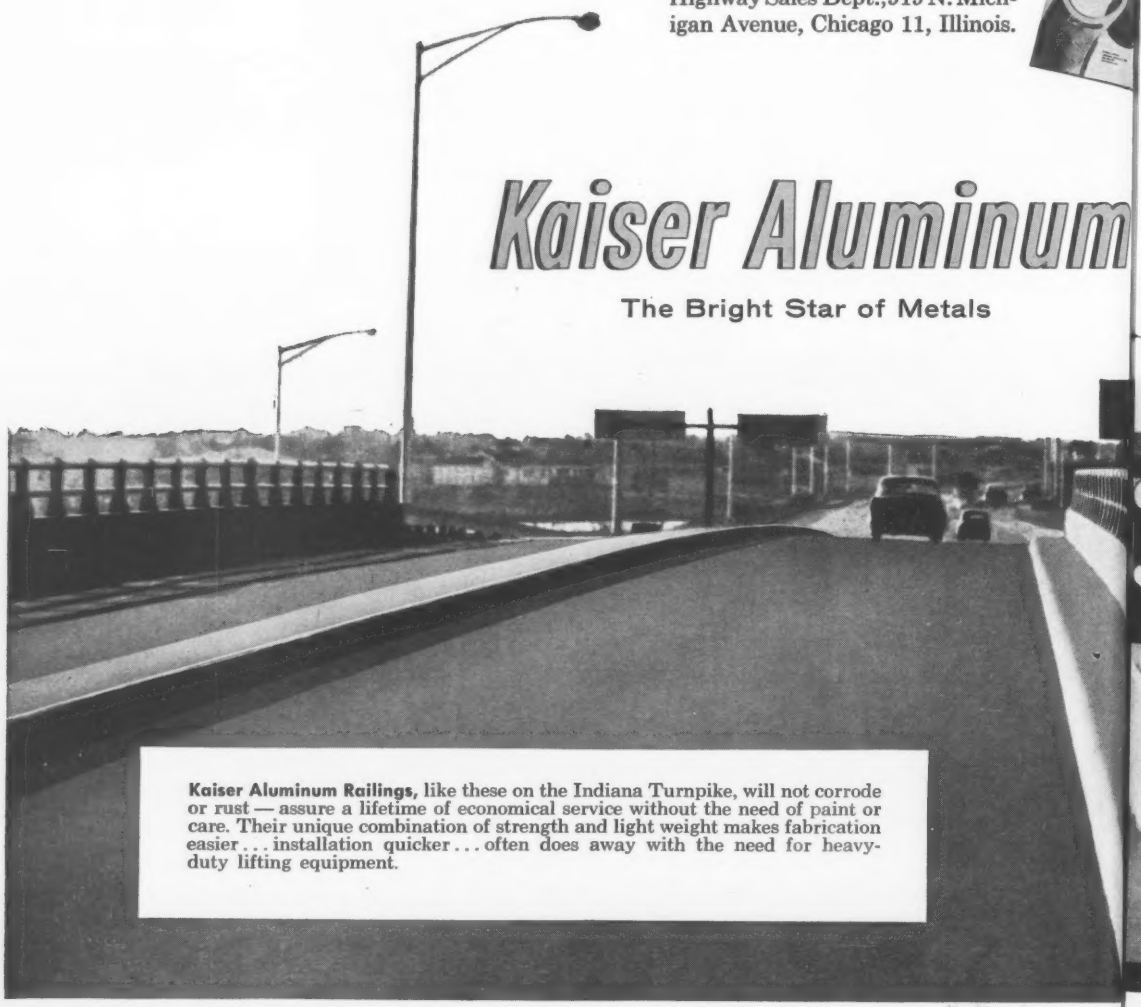
Brochure on request. For your copy — plus complete information on products, availabilities and special applications where aluminum can meet your road building needs — contact your nearest Kaiser Aluminum sales office. Or write Kaiser Aluminum & Chemical Sales, Inc., Highway Sales Dept., 919 N. Michigan Avenue, Chicago 11, Illinois.

Kaiser Aluminum

The Bright Star of Metals



Kaiser Aluminum Railings, like these on the Indiana Turnpike, will not corrode or rust — assure a lifetime of economical service without the need of paint or care. Their unique combination of strength and light weight makes fabrication easier... installation quicker... often does away with the need for heavy-duty lifting equipment.

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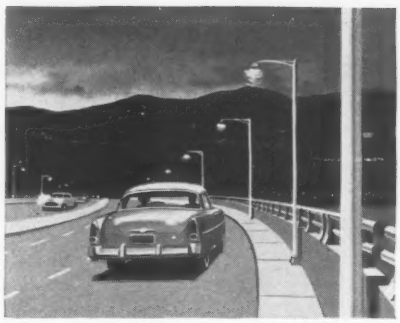

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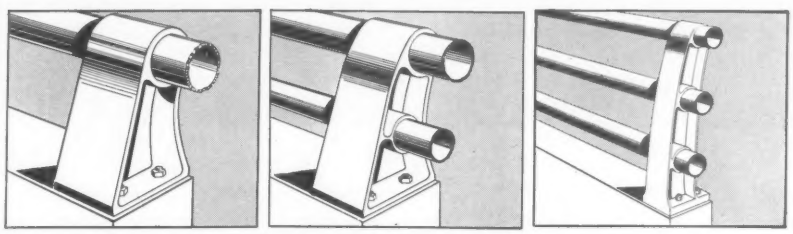

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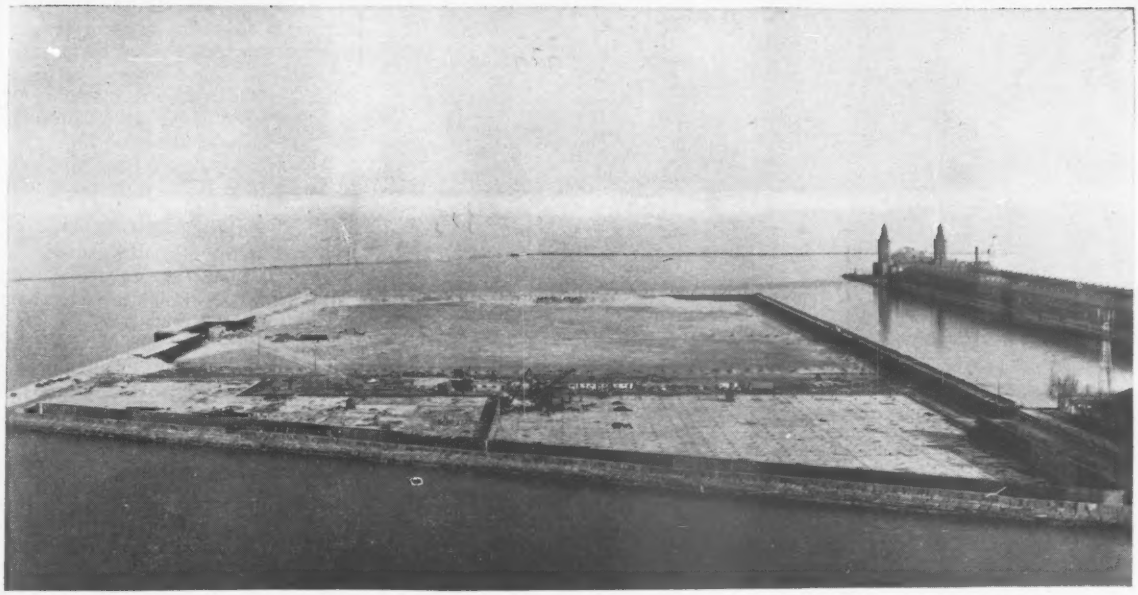


Now abuilding on 61 acres reclaimed from Lake Michigan is the world's largest water treatment plant.

Chicago Builds Biggest Filtration Plant

George S. Salter
Chief Filtration Engineer
Department of Public Works
Chicago, Ill.

Chicago's Central District filtration plant, when completed about four years from now, will be by far the world's largest municipal filtration plant. Located just north of Navy Pier, the 960 mgd plant will provide filtered water to about 3,000,000 people residing in the northern two-thirds of Chicago and adjacent suburbs.

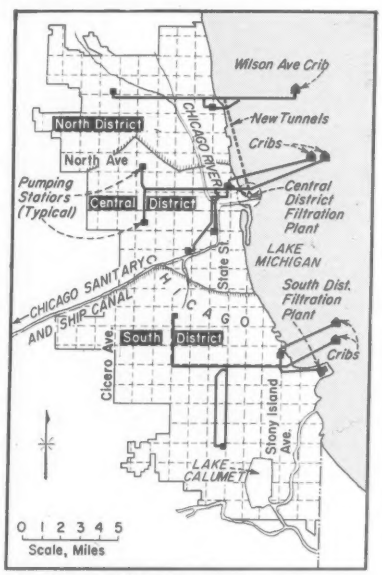
Estimated cost of the plant, including its connecting tunnels, is about $90 million. Five contracts, aggregating $35 million, have been let to date.

Many people ask why filtration is necessary in Chicago. Those familiar with the difference in the water being furnished on the south side—from the 320 mgd South District filtration plant—and that on the north side, especially at certain times during the year, would have a ready answer: "The unfiltered water is dirty, it is sometimes odorous and, if not chlorinated, is potentially dangerous."

Chicago is the only large city on the Great Lakes that does not have complete filtration. Practically every other community along the west shore of Lake Michigan has filtered water.

• **Raw water quality**—Lake Michigan water has a normal average turbidity of about 10 ppm but there are times when it exceeds 150 ppm. The periods of greatest turbidity occur during and after storms on the lake.

Most of the larger hotels and hospitals in the Central and North Water Districts have their private filter installations and many offices and shops use bottled water. It has been estimated that the costs of operating these filters and of bottled water exceeds the estimated cost of operating the proposed plant.



A CITY DIVIDED—filtered water for 3 million persons in the northern two-thirds of Chicago, and adjacent suburbs will be supplied by the new filtration plant by 1961. The southern one-third of the city is served by the South District filtration plant.

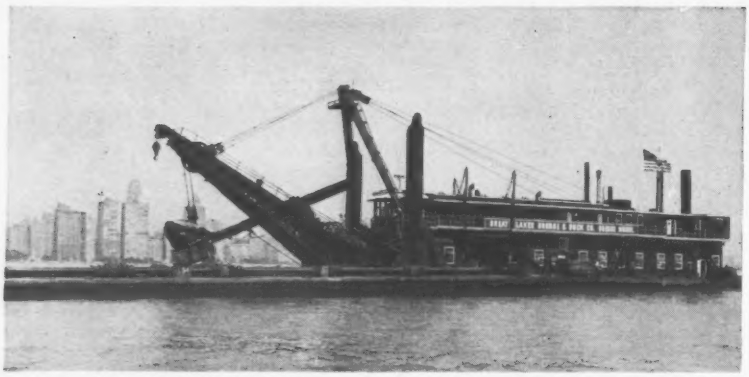
• **Industrial pollution**—The prevalence of sewage and industrial wastes in the Lake Michigan water was also an important factor in determining the need for filtration. Although the dumping of raw sewage into the lake has been largely discontinued, there are still times when there is considerable pollution, especially from industrial wastes.

This is particularly true for the south end of the lake near large industrial developments in that area. The very unfavorable water supply condition in the south end of the lake in the early 1930's was the reason why priority was given to the construction of the South District plant.

• **High coliform count**—The U. S. Public Health Service has established a coliform index of 50 per 100 cc as the maximum safe limit for water to be treated by simple chlorination. There were 33 occasions during 1956 when the bacterial samples of the raw water exceeded that limit, and in one instance the index reached 270 per 100 cc. The 1956 yearly average MPN (most probable number) was 38.59.

It should be noted, however, that the bacterial quality of the treated

. . . Chicago's water treatment plant



JUMBO-SIZE MARINE EQUIPMENT used in preparing the 61 acre site included the 12 cu yd dipper dredge Mogul for trenching cofferdam foundations . . .

. . . **A FLEET** of derrick barges to build the stone-armored cofferdam . . .

. . . **AND A BATTERY** of two 10 in. and three 6 in. pumps to dewater the site.

water in the distribution system from the South District filtration plant had a coliform index (MPN) of only 0.026 per 100 cc. Moreover, that which received chlorination only in the Central and North Districts, had an index of 0.143. Both were well below the permissible USPHS drinking water standards for common carriers, which permits a maximum average of 1.0 per 100 cc for a safe water.

• **How it got started**—It might be said that the history of the Central District filtration plant began back in 1925 when Arthur E. Gorman, engineer of water purification, wrote a report on providing filtered water for Chicago. In his report, he recommended that the city initiate a filtration plant construction program as soon as possible.

The following year John R. Baylis, now Chicago's engineer of water purification, was retained to make a study of the treatment of Lake Michigan water. Shortly thereafter, an experimental filtration plant was built on the south side near the 68th Street pumping station. Experiments conducted at that plant were used as the basis for many of the design details for the South District filtration plant.

Filtration was given a further impetus in 1930, when, by referendum, the voters approved by a 68% affirmative vote the proposition: "Shall the City Council pass an ordinance providing for the filtration of Chicago's water supply?"

The city adopted the policy of filtration and, between 1930 and 1936, an extensive series of reports were prepared by Mr. Baylis on the treatment of Lake Michigan water, and by Mr. Gorman on water purification plants—with special emphasis being paid to the requirements of the South Water District.

These studies culminated in the preparation of plans and specifications for the $24 million South District filtration plant. Construction of that plant began in 1938; initial operation occurred on Sept. 20, 1945 (ENR, Sept. 27, 1945, v.p. 402); and the plant was placed in complete operation in 1947.

• **Design techniques**—It might be noted that operating experience at the South District filtration plant is being used extensively in designing the Central District plant.

Variations in methods of treatment, high rate filtration (the 320 mgd plant has operated at rates as high as 546 mgd), new methods of handling chemicals in the liquid and slurry form, and new types of equipment are being tried out at that plant. Those which are found satisfactory and desirable will be used in our new plant.

Since the South District plant is presently the largest municipal filtration plant in this country, some people accuse Chicago of having the biggest experimental unit that was ever built.

• **Early planning**—While the South District filtration plant was under construction, studies were continued on providing filtered water to the Central and North Water Districts. These studies led, in 1940, to a report by Mr. Gorman, in which he recommended

(*Continued on page 54*)

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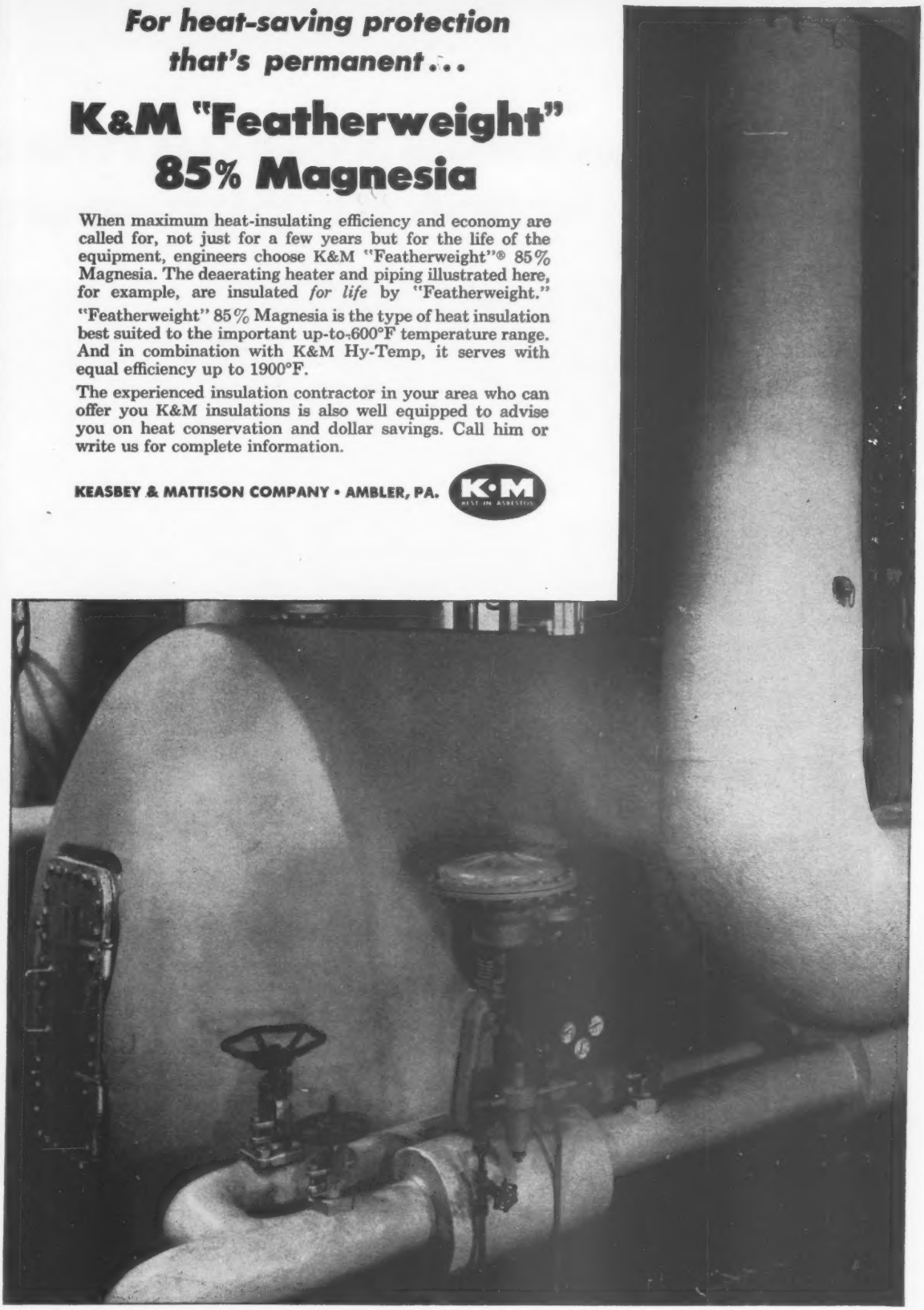

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The 5/8" and 3/4" panels of Exterior PlyForm used on the job gave an average of 30 re-uses. Less than 100,000 square feet of Exterior PlyForm was required for all form work on beams and roadbed of the four-lane structure.

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. . . Chicago's water treatment plant

TEN ACRE FLOOR SLAB of 69 mg filtered water reservoir was placed in the dry 10 ft below lake level, using ready mixed concrete pumped into place. The completed reservoir will contain 47,500 cu yd of concrete and 9 million lb of reinforcing steel.

that a plant to supply water to the Central District be located near Chicago Avenue just east of Lake Shore Drive.

At that time it was planned that separate filtration plants would be provided for the Central District and for the North District. In connection with this recommendation, it should be noted that when the shaft at Chicago Avenue and Lake Shore Drive on the Chicago Avenue tunnel was built in 1934-35, provision was made in this shaft for a future connection from the filtration plant which was expected to be built in that area.

• **Design plans**—The preparation of plans for the Central District filtration plant actually began early in 1945, when the City Council passed an ordinance approving water purification as one of the projects for general postwar planning.

This advance planning was supposed to take up the slack in construction which most people believed would develop after the end of the war. Accordingly, late in 1945, applications for planning funds were made to both the federal government and to the Illinois Postwar Planning Commission. Early in 1946, funds were advanced to the city by both of those agencies for advanced planning, and the city council included in its 1946 budget an appropriation for studies and plan preparation for filtration plants.

Shortly thereafter, the consulting engineering firms of Alvord, Burdick & Howson and Greeley & Hansen were retained to make a report on filtration plans for the Central and North Water Districts.

• **Final recommendations**—In December 1946, the consulting engineers submitted their report in which they recommended a single 950 mgd plant to serve both the Central and North Water Districts. They also recommended that the plant be located in Lake Michigan just north of Navy Pier and east of Lake Shore Drive. The plant has since been known as the "Central District Filtration Plant."

Some knowledge of the general arrangement of Chicago's waterworks system will be helpful in showing the function of the plant in Chicago's water supply.

• **Chicago's waterworks system**—Chicago's water supply system consists of three districts, as shown in an accompanying illustration. Each district has a separate tunnel system—including one or more cribs in Lake Michigan—and a number of pumping stations. In accordance with their locations they are designated as the South, the Central, and the North Water Districts.

The South Water District includes that part of Chicago which lies south of the general line of 39th Street (Pershing Road). The water system for this district consists of an intake crib in Lake Michigan, the South District Filtration plant, a 24 mile system of tunnels varying in size from 6 to 16 ft., three pumping stations, and an extensive distribution system.

It furnishes clean sparkling water from the filtration plant to the more than 1,400,000 residents in the South Water District and to suburbs south and southwest of the city.

The Central Water District includes the area between 39th St. on the south and the approximate line of North Ave. on the north. This system consists of a lake intake crib, approximately 20 miles of tunnel varying in size from 6 to 16 ft, five pumping stations and the necessary distribution system.

It furnishes water to approximately 1.8 million people, including the residents of several suburbs west of the city. This water is untreated, except for the chlorine added to assure its bacteriological safety.

The North Water District includes the city area north of the approximate line of North Ave. The water system consists of a lake intake crib, approximately 10 miles of tunnel varying in size from 6 to 13 ft, three pumping stations, and an extensive distribution system. It furnishes water to approximately a million people in Chicago and several suburbs west and northwest of the city. This water is untreated except for chlorination.

It should be noted that, although the tunnel systems of the three water districts are not interconnected, the distribution lines for districts are connected at numerous points. But lines of demarcation between them are not exact.

• **Construction bottleneck**—Although the consultants' report had shown quite conclusively that the construction and operation of the plant at the site recommended was best from an operating standpoint and that it was the most economical location, a number of objections were made to the location of the plant at that site.

Most of these objections came from residents and property owners on the near north side. They claimed that the construction of the plant would deprive them of valuable property rights; that the area should be retained for possible future harbor developments; that it violated riparian rights in the area, and that it was an improper use of public funds.

During the period 1947-1949, an extensive series of conferences and hearings were held by various committees and sub-committees of the City Council on this matter. The question was submitted to the Park District and the Chicago Plan Commission for their comments.

• **Park District agreed**—The Park District indicated that the construction of the plant at the location recommended did not conflict with their interests, but the Chicago Plan Commission recommended that the plant be located in a so-called blighted area north of Chicago Ave. and east of the north branch of the Chicago River.

Although admitting that the plant would probably cost more at the latter location, they expressed the opinion

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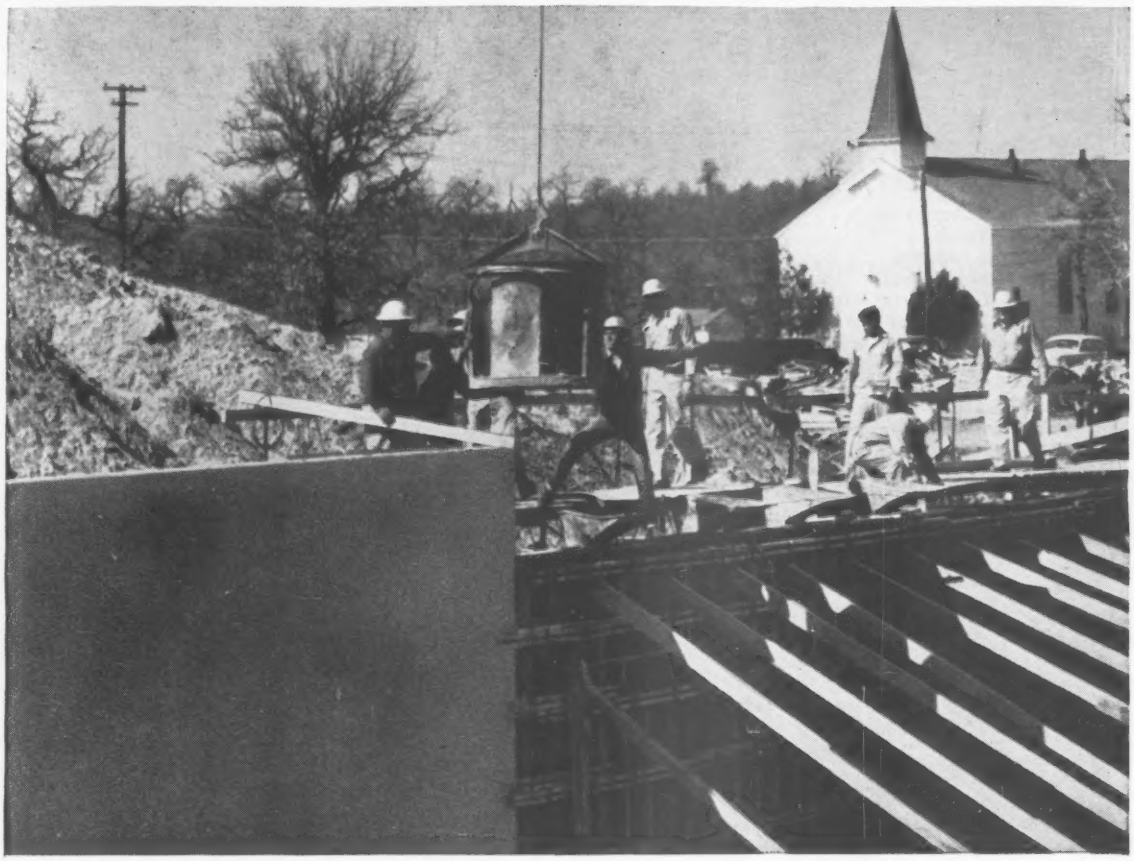

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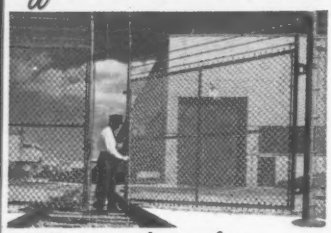

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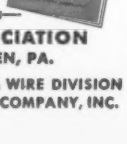

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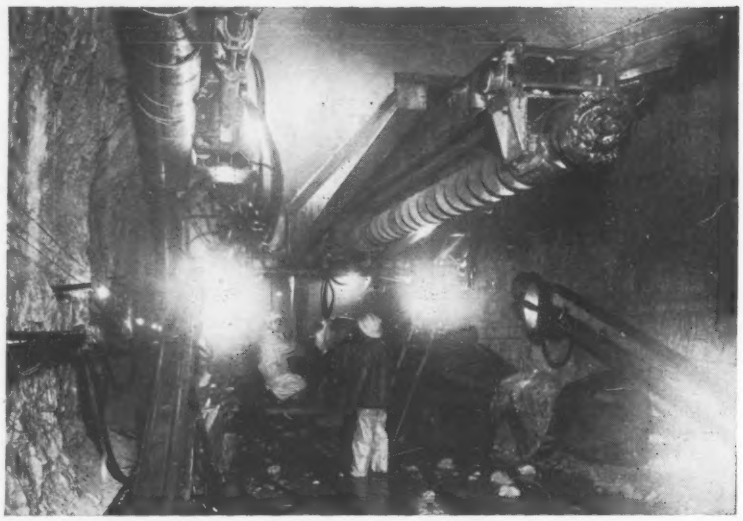
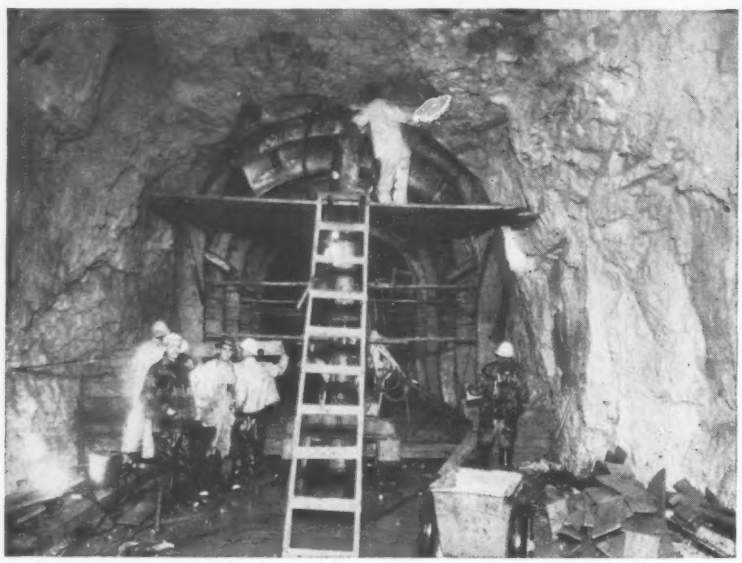
. . . Chicago's water treatment plant



DRILLING JUMBO for 16 ft filtered water tunnel mounts auger to drill 10-in. pressure-relief hole in heading for better breakage . . .



. . . **WHICH EXPEDITES** setting the forms for placing the concrete liner.

that the additional cost would be warranted as it would contribute to the alleviation of slum conditions in that area.

While these hearings were being held, the city engineers made studies and prepared estimates on nine other possible locations for the plant. The costs of plants at those locations were from $5 million to $15 million more than for a plant at the location recommended.

• **Site approved in 1949**—After all these hearings, studies and conferences by the many committees and organizations involved, the City Council, in November 1949, approved the site for the filtration plant in Lake Michigan, 400 ft north of Navy Pier and 500 ft east of Lake Shore Drive.

The site approved by the council is a few hundred feet east of that recommended by the consultants, thus avoiding encroachment on any riparian rights the property owners in that area might have. This location has since been known as the Navy Pier site.

Following council approval of the site, applications were filed with both the state and federal governments for permits to build the filtration plant in the area approved by the council. Early in 1950 the city began taking soundings

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New Forming Technique Produces Sawed Joints At Less Cost

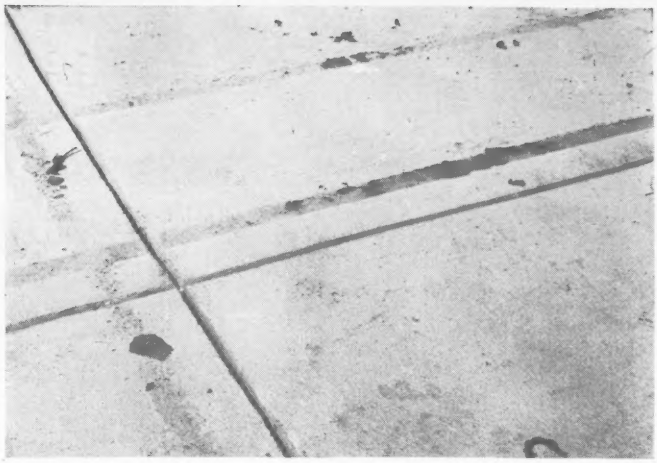
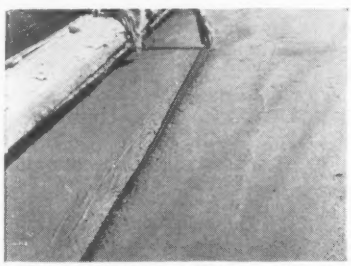


FIGURE 1

...uses KORK-PAK® as dummy joint filler; removes filler after concrete cure by sawing

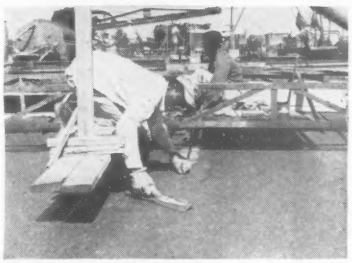
An interesting new joint forming and sawing technique, in which lengths of KORK-PAK®—a non-extruding expansion joint filler, are used as a dummy joint filler and then sawed out by an inexpensive ⅜" carborundum blade after the concrete has cured, has been developed and used with good results by T. L. James Construction Company on a Mississippi State Highway Project. Location of the Project was on Route 51, south of Jackson, Miss.

Clean, straight ¼" joints (Fig. 1) are produced at a fraction of the cost of sawing ⅛" joints in the ordinary manner with a diamond blade. Joint sawing speed was considerably increased, and the resulting ¼" wide joint was sealed with "Zero-Lastic."® a single component, cold-applied joint sealing compound manufactured by Servicised Products Corporation, Chicago, who also produce the KORK-PAK material used on the project.



KORK-PAK DUMMY JOINT is embedded in concrete. *Figure 2*

KORK-PAK is a composition of asphalt and granulated cork, formed between two sheets of asphalt saturated paper. It is non-extruding and is readily handled without breakage. It is a general purpose joint filler widely used on highway and turnpike projects. The KORK-PAK material was easily sawed out and did not gum up the blade, as did other types of asphalt and hard-board joints.



HAND FINISHING over embedded joint produces smooth surface. *Figure 3*

Essentially, the new technique consists of embedding ¼" wide x 2" high lengths of the KORK-PAK in transverse and longitudinal joints at the time the concrete is being placed (Fig. 2). Transverse joints were spaced at 31'4" intervals. The small surface sections of concrete disturbed by insertion of the joint were finished by hand. (Fig. 3).

At a convenient time (because cracking was controlled by the dummy joint) the contractor, using a saw with an abrasive blade, quickly and easily removed the top inch of the KORK-PAK (Fig. 4), leaving the other inch undisturbed in the concrete. Sawing the joint when convenient eliminated the necessity of overtime.

AFTER CONCRETE CURES, top 1" of dummy joint is sawed out. *Figure 4*

Using the KORK-PAK dummy joint technique, the contractor reported getting from 2500 to 3000 lineal feet per blade. The ¼" joint obtained was practical to seal and gave the pavement the same riding qualities as one in which the joints were sawed by a diamond blade in the conventional manner.

SEALING JOINT — "Zero-Lastic" Cold-applied material is pumped into joints from container. *Figure 5*

After cleaning the sawed joints, the contractor applied Servicised "Zero-Lastic" Joint Sealing compound (Fig. 5) in the usual manner.

More information and specific details on the material and equipment used on this project are available from Servicised Products Corporation. Write for the Servicised Catalog which contains valuable data and complete details on Servicised Asphalt, Cork and Rubber composition products for the construction industry.

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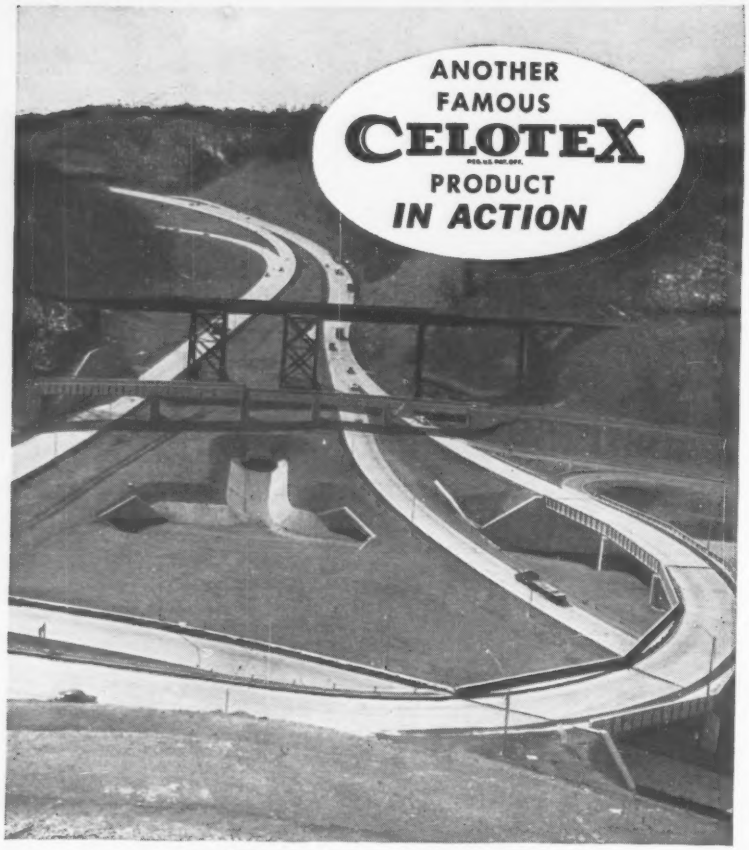

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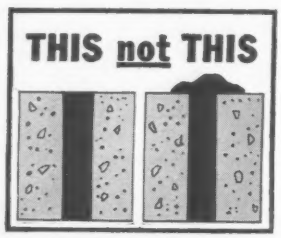

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and soil borings to determine foundation conditions in the area to be occupied by the plant.

Work also began on the design and preparation of plans and specifications for the cofferdam, the construction of which would permit the dewatering of 61 acres of the bed of Lake Michigan on which the plant would be built.

In February 1950, hearings were held by the U. S. District Engineer. All interested parties were invited to present their objections to the use of the area in Lake Michigan for the filtration plant. Strong objections were raised by several near-north side individuals and organizations but no objections were expressed by Great Lakes shippers—the only people who might be adversely affected by the location of the plant in navigable water.

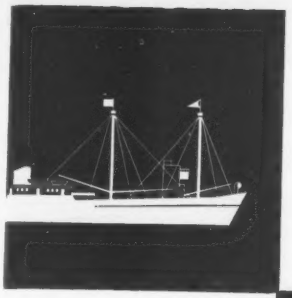
In April of that year the city was advised that a state permit was not required because previous legislation had specifically given the city the right to use submerged land in Lake Michigan for filtration plant purposes.

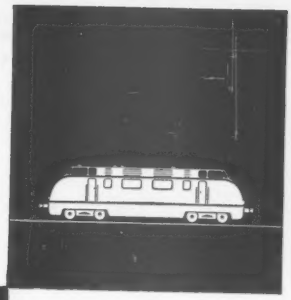
• **Construction began in 1951**—In January 1951, the permit for use of the area was obtained from the federal government, and shortly thereafter the first piles for the cofferdam were given by the city. The city meanwhile continued making surveys, soundings and borings to rock, over both the area to be occupied by the filtration plant and along the line of the connecting tunnels to the North Water District. In August, Alvord, Burdick & Howson and Greeley & Hansen were retained by the city to prepare outline drawings for all plant structures except the cofferdam and the tunnels. Plans and specifications for these units were being prepared by the city.

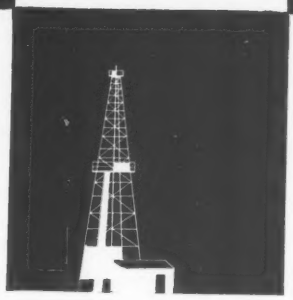
• **Legal obstacles**—In December 1951, bids were received on the construction of the cofferdam. The low bid of $6.6 million was by Great Lakes Dredge and Dock Co., and they started work early in June 1952. Later that month, however, the objectors to the building of the filtration plant in that area filed suit in the Circuit Court to enjoin the city and the contractor from work on the project. The contractor with the approval of the city, however, decided to continue work on the cofferdam pending the hearing on the suit.

The court hearing was not held until May 1953, and it was August 28 before a decision was rendered. On that date, an order was issued restraining the city from proceeding with work on the cofferdam (ENR, Sept. 3, 1953, p. 23).

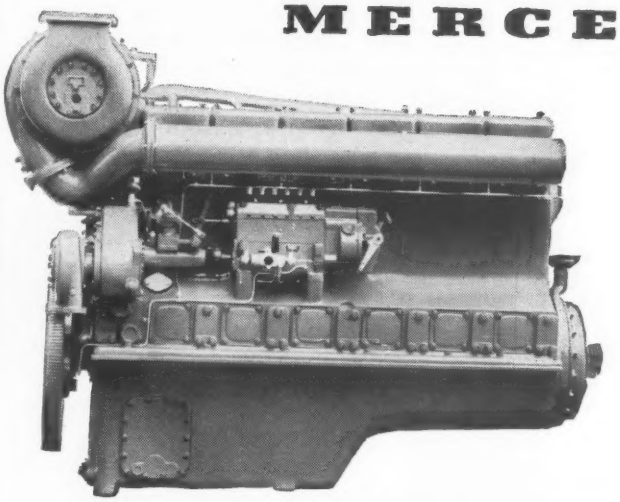
Meanwhile the city had proceeded with preparing plans and specifications on other units of the project and had taken bids for the tunnel work. Following the issuance of the restraining







MERCEDES-BENZ



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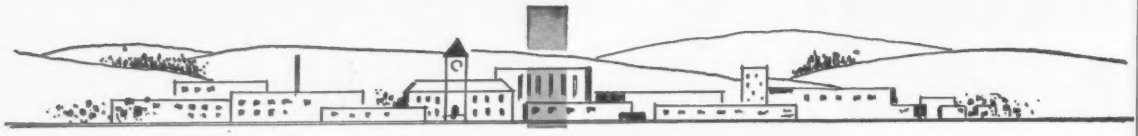
How would you save a failing sewer in quicksand, 42 feet underground?



Yes, it was a tough question, but Armco Liner Plates provided an easy answer. Here's the chain of events:

In Owensboro, Kentucky, an 84-inch-diameter rigid pipe trunk line, carrying sanitary and storm sewage, began to fail. It had been tunneled through quicksand, and now was developing large cracks that admitted sand. To complicate the problem, the sewer was 42 feet underground and any repair had to be made while the sewer was in operation.

The project was opened to competitive bidding, and Armco Liner Plates got the job. Individual pre-curved, corrugated metal plates were taken into the failing sewer and bolted together from the inside to make an integral lining structure. No space was wasted. And the offset-lapped joint of Armco Plates provided extra strength.

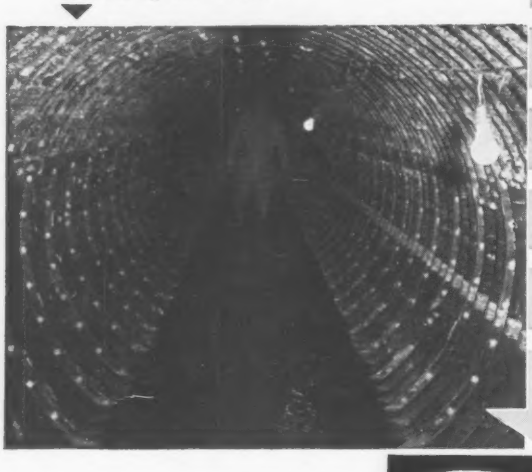
For this sewer lining job, the Armco Liner Plate structure was 72 inches in diameter. The 10-gage plates were bituminous coated.

* * *

Armco Liner Plate is one of more than 30 Armco Products used for highway, railway, commercial, industrial and municipal applications. All are economical and easy to install, and have established reputations for durability. Write for details. Armco Drainage & Metal Products, Inc., 5177 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

RIGHT: Worker is attaching another Armco Liner Plate. Note water flowing during installation and the absence of waste space between the old and new structures.

BELOW: The completed Armco Liner Plate structure being inspected after a siege of high water. Note perfect alignment and high water marks.



ARMCO ARMCO® **CONSTRUCTION PRODUCTS**

order, work on the cofferdam was discontinued and all bids on the tunnel work were rejected.

The city then filed an appeal with the State Supreme Court and, in March 1954, the hearing was held on the appeal. This court, on May 24, 1954, by unanimous action, ordered the dissolution of the restraining order (ENR, June 3, 1954, p. 23). Work was shortly thereafter resumed on the cofferdam and the city continued with the preparation of plans and specifications for other units of the work, including readvertising on the tunnel work.

The complainants in the case appealed the decision to the U. S. Supreme Court but that court, on October 18, rejected their appeal.

• **Four major contracts**—Work on the project has proceeded at an increased tempo since that time. Bids were taken on the tunnel work in June 1955, $12.7 million (Grafe-Tecon-Mittry & Drake); filtered water reservoir in September 1955, $3.9 million (Herlihey Mid-Continent Co.); low lift pumps and motors, October 1956, $1.5 million (Fairbanks Morse Co.), and filter substructures, Jan. 1957, $9.9 million (Gust K. Newberg Co.).

Studies and the preparation of plans and specifications had meanwhile been progressing on many other units of the work. Also, the consulting architectural-engineering firm of Naess and Murphy had been retained to make general architectural studies for the entire plant, and to prepare detailed plans and specifications on both the substructures and superstructures for the head house area, including the pumping station, chemical building, offices, shops, boiler room and laboratories.

• **1957 contracts**—Plans and specifications are currently being prepared for some of the filter equipment (filter bottoms and gravel, sand and washwater troughs), estimated to cost about $3 million; and on some 300 butterfly valves, estimated at about $1.5 million. Bids will be received this summer.

These contracts will be followed by plans for the settling basins, estimated to cost about $13 million, and for the substructure of the head house, estimated at about $6 million.

•**Future contracts**—Other work on which bids should be received during 1958 and 1959 include the superstructures for both the filters and the head house area, numerous equipment contracts, electrical work, backfill, landscaping and roads.

One of the most important—and probably one of the most difficult—contracts is that of making connections to the existing tunnels. These tunnels have to be maintained in service until the plant is in operation, and then the switchover from raw to filtered water has to be made with no interruption in the supply of water to the various pumping stations.

• **Construction yardstick**—Some idea of the size of the plant might be indicated by the areas covered and the quantities of construction materials required.

The walls of the cofferdam are 6,475 ft in length and enclose an area of 61 acres. The substructures cover an area of 44 acres, and the superstructures an area of 23 acres.

Major construction items for the substructures include 115,000 untreated timber piles totaling 6.8 million lin ft; 265,000 cu yd of concrete; 37,500 tons of reinforcing steel; and 1,000 tons of castings.

The construction of the Central District Filtration Plant is being financed entirely by money received from the operation of Chicago's waterworks system. No tax money is used. Water certificates issued for construction are retired by water revenue.

The design of the plant is being done or supervised by the Filtration Design Division of the Bureau of Engineering in the Department of Public Works. The designs are prepared in consultation with the Department of Waters and Sewers, which will operate the plant when completed. The construction is being supervised by the Construction Division of the Department of Public Works.

George L. DeMent is commissioner of public works, Dick Van Gorp is chief engineer and Walter E. Rasmus is assistant chief engineer. The author is in charge of designing the entire $90 million project. Carl Riggenbach, assistant engineer of waterworks construction, is in direct charge of the project, and Arne Anderson and Frank Misischia are resident engineers.

North Carolina Road Work Hits $62.9 Million Mark

North Carolina is currently engaged in the biggest road construction program in its history, according to Highway Chairman A. H. Graham.

A total of 189 highway projects with a value of $62.9 million and involving 980 miles of road are in various stages of construction throughout the state. Since January a total of $36.4 million has been contracted for; of this $28.5 million is for actual construction costs, while the rest will go for right-of-way, engineering and contingencies.

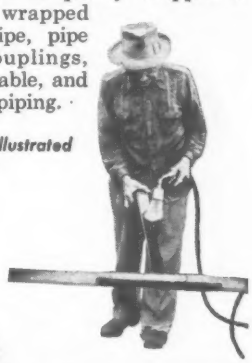
Do You Have This PIPE PROTECTION PROBLEM?

Underground piping must be protected against destructive forces of corrosive soils and electrolytic conditions. Normally, coal tar coating as called for in AWWA specifications C-203 and C-204 would be hot-applied at a coating mill. However, there are times when the volume of pipe involved or the distance of a coating mill make this impractical from a time and cost standpoint.

You'll find the ANSWER with TAPECOAT® . . . the Quality Coal Tar Coating in Tape Form

TAPECOAT is the widely-accepted alternate material that is equivalent to mill-applied hot coal tar protection. With this easy-to-use material, protection can be applied in the field by your own men, because technical know-how, kettles and special crews are not required. You save time and money while providing the long-life protection called for.

TAPECOAT is easily applied, using a torch to soften or bleed the pitch which gives both bond and protection. Available in widths from 2″ to 24″, it is spirally wrapped or cigarette wrapped around pipe, pipe joints, couplings, conduit, cable, and insulated piping.



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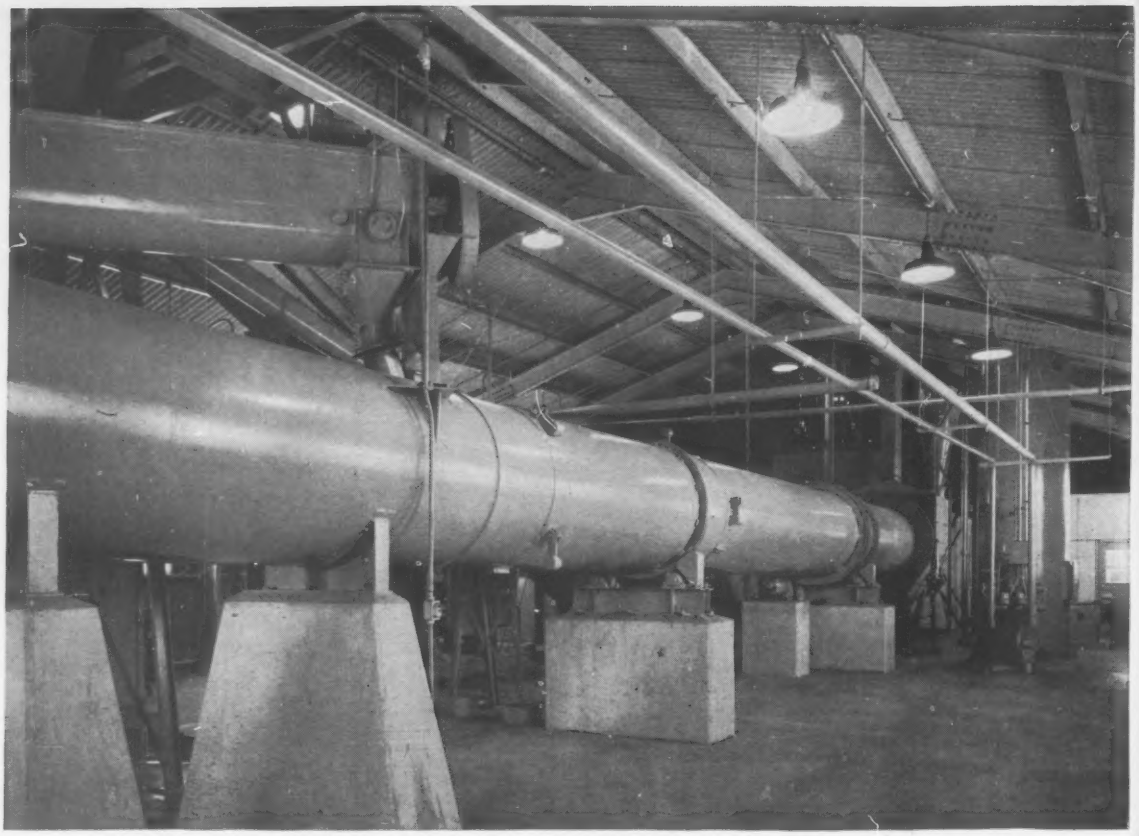


ROTARY SLUDGE DRYER at Corpus Christi sewage plant is 4 ft in dia and 42 ft long, dries product to 6% moisture.

Sludge to Fertilizer in Rotary Dryers

Two sewage disposal plants in Corpus Christi, Tex., are now using rotary dryers as part of the sludge disposal process.

The new dryers are inclined steel cylinders 4 ft in dia and 42 ft long. They are fed from pugmills which mix wet feed with recycled dry product. Dryers are fired with either natural gas (plentiful in Texas) or digester gas.

In operation, the dryer cylinders rotate slowly, continuously dropping wet sludge through drying air. Small mallets mounted on two bands around the cylinders strike the outer shell as it revolves, the resulting sound giving the operator some indication of the condition of incoming sludge. The end product, dried to 6% moisture, is mechanically bagged and sold for fertilizer.

One of the Corpus Christi disposal works, the Broadway plant, is a 15 mgd installation comprising two stage filtration with intermediate clarifiers and sludge digestion plus the recently added vacuum filtration and rotary drying of sludge. The second plant, at Oso, is a 7 mgd activated sludge works with preaeration facilities, wherein sludge is diverted to a holding tank and thence through the newly constructed thickener, vacuum filter and rotary dryer. A portion of the sludge can be digested and pumped directly to the new dryers.

Corpus Christi went to sludge drying because of the hot south Texas climate coupled with high humidity due to its coastal location. At least six months of every years are unfavorable for outdoor bed drying while excellent fly breeding conditions prevail nine months of the year.

• **Dryer plants**—The Oso sludge drying facilities consist of a 200 gpm air flotation thickener (9 ft dia) that increases activated sludge concentration from 1% solids to 7%. The vacuum filter, a 11½ ft dia 10 ft long unit, further increases the solids concentration to 23 to 27%, for a rating of 2,400 lb of dry solids per hr.

The rotary dryer at Oso can evaporate 8,600 lb of water per hr, equivalent to drying 2,400 lb of dry solids per hr with 78% cake moisture to 6%.

At the Broadway plant, which handles all digested sludge, 680 lb of dry solids per hr comes out of the digestors at 7 to 10% solids. A vacuum filter 8 ft in dia and 6 ft long raises concentration to 28% solids. The rotary dryer at Broadway is evaporating 2,000 lb of water per hr, turning out 680 lb of dry solids per hr at 6% moisture.

Difference in capacities of the two plants is due to the reduction of sludge in the Broadway digesters.

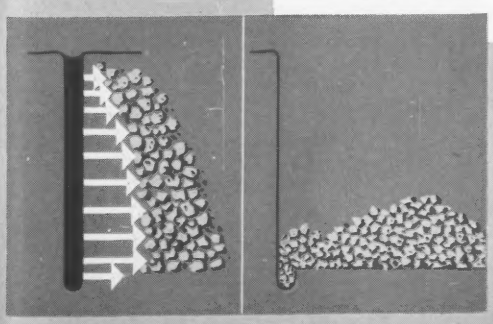
• **Early operating costs**—The Oso dryer installation went into operation in July, 1956, while the Broadway plant started up in November of that year. Because of the short operating experience to date, current production costs are not as low as they can be. But so far, dry product (6% moisture) is costing $2 per bag, bag weight varying from 65 to 80 lb for dried raw and activated sludge from Oso, 80 to 85 lb for digested raw and activated sludge from that plant. The $2 figure includes 12 cents for the bag itself, but does not include amortization of the plant. Fig-

HERE'S A NEWS BULLETIN

This technical bulletin contains information that can help you get quieter, more efficient blasts.

Every issue contains discussions on important blasting problems by D. M. McFarland, manager of the Technical Customer Service Section.

New, improved blasting procedures are graphically explained. New materials are reviewed and evaluated.



To keep users of explosives posted on the latest in blasting developments

You'll be up on new explosives products and blasting techniques that can give you more efficient, economical results when you become a regular reader of "*Better Blasting*."

"*Better Blasting*" is published as a technical service by Atlas Powder Company. Each quarterly issue contains important safety information and such features as loading procedures that pay off in better shots . . . methods that minimize noise and vibration, and assure improved public relations.

You'll especially look forward to "Mac's Notes," an interesting column by Dave McFarland, often called "the father of millisecond delay blasting."

Start "*Better Blasting*" coming your way—free of cost or obligation. Write Atlas to put your name on the mailing list.

Ask also about the new Atlas safety movie, "*How to Handle Women and Explosives*" . . . or the public relations film, "*We're Blasting Near You,*" which you can show to your neighbors to illustrate your efforts to minimize disturbance.

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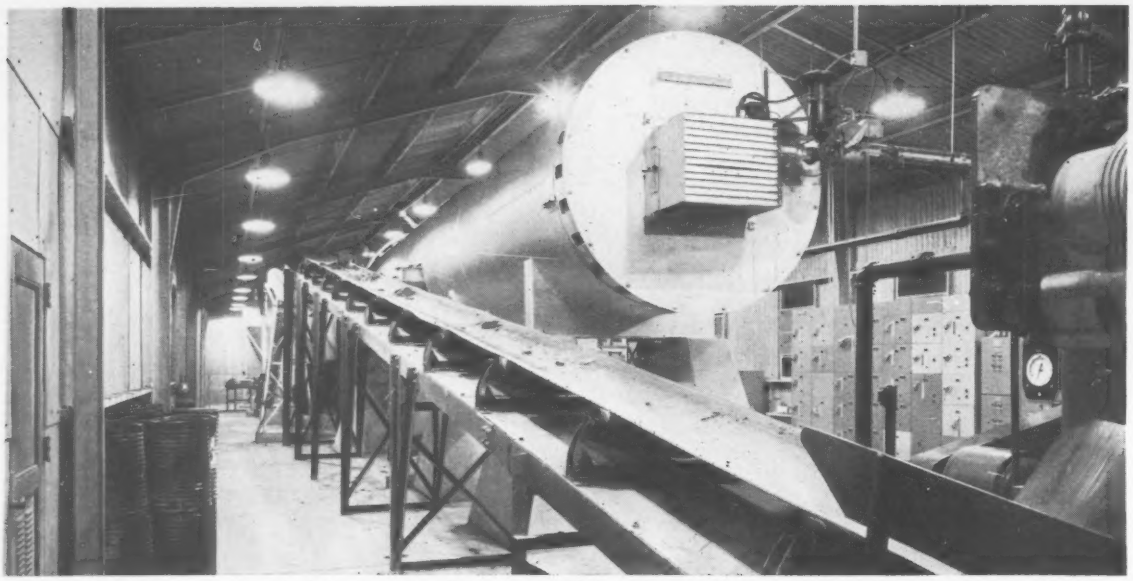


BELT CONVEYOR carries raw feed from vacuum filters to pugmill (not shown) where it is mixed with recycled dry product prior to entering dryer. Burner end of rotary unit is shown.

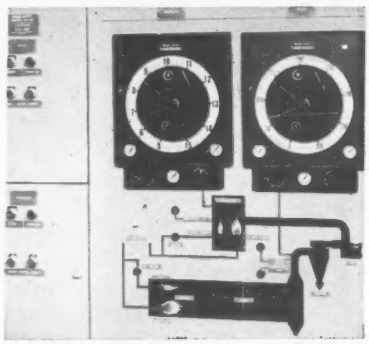
ures begin from the thickeners. Each dryer plant requires one operator and helper in attendance plus one laborer half time. Controls are push button, but not automated.

Initial cost of the Oso dryer facilities including a building housing the vacuum filter and rotary dryer was $173,000. The Broadway installation, comprising the vacuum filter and rotary dryer, was constructed for $151,000. Neither cost includes electrical costs, which were minor.

The rotary dryers were developed and supplied by Standard Steel Corp., Los Angeles, and are known as Standard-Hersey dryers. Sigler, Clark & Winston of Weslaco, Tex., were consulting engineers on the dryer plants. H. B. Zachary Co., San Antonio, built the Oso works; Burnett Construction Co., Corpus Christi, had the contract for the Broadway dryer plant, subbing the rotary dryer to W. R. Cook Co., Corpus Christi.

Drahn Jones is director of public works for Corpus Christi, S. L. Allison is head of the sewerage division.

As far as is known, Standard Steel is the only manufacturer of rotary dryers at present. The city of Houston, Texas, had a rotary dryer installed several years ago, but the manufacturer went out of business shortly thereafter.



GRAPHIC PANEL provides simple means for operator to follow dryer performance.

OLD AND NEW: Discarded sludge drying beds are in foreground, new building housing rotary dryers is above.

Tournapull operator sits up high, has clear view of load, pusher, blade, and road. All scraper controls are in front of him; gear shift lever is close to his right hand. He can concentrate on dirtmoving, relaxed.

How *easy-to-run* scraper makes best use of manpower

. . . new operators run "D's" at 22-loads-an-hour pace

Your skilled manpower needs will be a problem for several years. ARB officials say that America's 240,000-man roadbuilding army will have to be doubled just to handle the 41,000-mile interstate highway program. Choosing earthmoving equipment that's easy to operate and understand will help you get the most out of your manpower . . . help you cash in faster on those big projects ahead.

Two completely inexperienced men were given the assignment of operating D Tournapulls in a southern city, recently. Neither man had ever run any type of earthmoving equipment before. The work involved moving 13,000 cu. yds. of clay and shale — part of building an 1150′ service road from a local hospital to a major U. S. highway.

Conditions were not particularly suited to "training" new operators. The haul-road included a 600′ stretch down an 11% grade and the return route was up an 8% grade. To make matters worse, a rainstorm of cloudburst proportions made the clay sticky and slippery.

1914′ cycles in 2.2 minutes

Bad working conditions were no problem for D Tournapulls and their inexperienced operators. After the cloudburst, the "D's" stripped and wasted top layer of wet material . . . were quickly back on production dirtmoving. Push-loaded by a LeTourneau-Westinghouse Tournatractor®, the speedy 'Pulls racked up big payloads fast.

Each operator and unit averaged 22.7 loads per hour . . . completing 1914′ cycles in 2.2 min. In one 5-hour period, one previously untrained operator hauled 111 loads, the other 112!

Easy-to-operate Tournapull® makes new operators good . . . good operators better

New operators are easier to train . . . good operators easier to get, and keep . . . because modern electrically-operated Tournapulls handle easily and with minimum effort. Getting the 'Pull underway is as simple as starting your car. Fingertip electric controls, on auto-like dashboard, are easy to reach and understand. They eliminate awkward stretching, twisting, and wrestling with hydraulic or mechanical levers. All-around visibility is excellent.

Tested safety features help, too. Center of gravity is low for stability; wide, low-pressure tires assure good ground grip; braking surface totals 2800 square inches. These safety aids give operator confidence for faster moving under any conditions . . . let him hop on and start building profits for you in a hurry!

Fast-stepping, 9-cu. yd. D Tournapulls are easy to operate, easy to schedule. With bare 8′ roading clearance, and within 9-ton axle-load limit, "D's" are roadable in all 48 states without permit. Write for detailed information on how they can help speed *your* earthmoving.

Simple, fingertip controls are clearly marked on dashboard. To steer, load, or spread, operator flicks a switch . . . electricity does the rest. Because control is so easy, operator learns faster, gets production speed quicker.

Speedy Tournatractor kept Tournapull production high. It push-loaded "D's" to capacity in soft, uncertain footing . . . dozed on fill between times. Like the 'Pulls, this 210 hp unit goes anywhere fast, under its own power.

DP-1493-DC-1

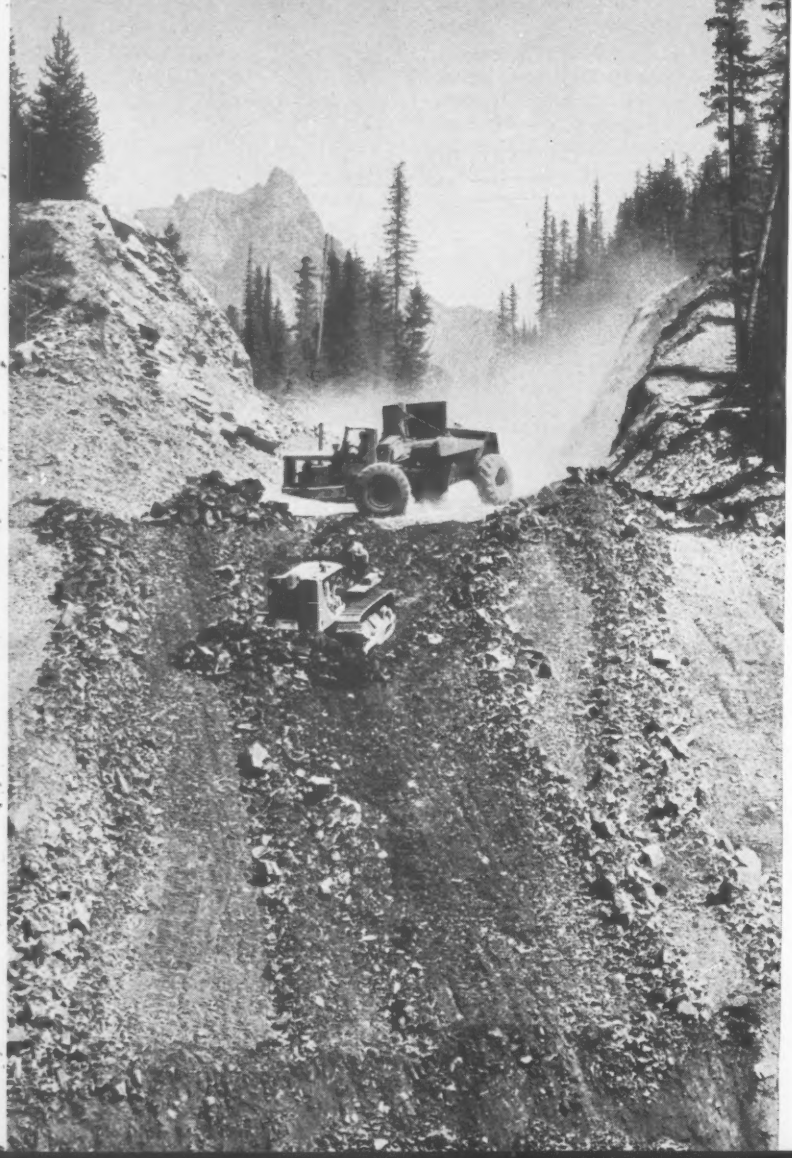
LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

WHERE QUALITY IS A HABIT

Earthmovers do double-duty

...relocate 5½ tortuous miles of U.S. 2, near "Continental Divide"



Tournapull® scrapers change river channel --convert to Rear-Dumps, outmaneuver trucks 5 loads to 4, hauling blast-rock

Completion of a million yards of tough earthmoving by Tony Marrazzo Construction Co., Boise, Idaho, has ended a motorists' nightmare east of Nyack, Montana, along "the most dangerous 5 miles in the entire cross-country length of U. S. 2". Road hazard was so bad, that even before surfacing, traffic started using new route to bypass hairpin turns in the old mountainside road.

Construction of a river-level road along Middle Fork, Flathead River — boundary of Glacier National Park — involved moving 1,000,000 cu. yds. of dirt and rock. To handle 75% of the yardage, Marrazzo used three 16-yd., 210 hp, self-propelled C Tournapull-Scrapers — plus 2 interchangeable, 22-ton rear-dump trail-units. Machines were equipped with Electrotarders — an auxiliary braking system which eliminated brake wear and provided added safety on long, steep grades.

Scraper trail-units used first

C Tournapull-scrapers dug out new channels to straighten 3 curves in the mountain river. To do this, they waded out thru water with full loads, working in the river bed without difficulty. Scraper units also handled other dirtmoving assignments along the job... built grade along the river... and cut off a sharp curve to relocate 1600′ of G.N.R.R. track.

Convert 'Pulls to Rear-Dumps Haul blast-rock to "Devil's Elbow"

In one 3000′ section of road, contractor had to drill, blast, and excavate 195,000 cu. yds. of rock. For hauling, contractor converted 2 "C's" to Rear-Dumps by a simple change of trail-units. The two 22-ton 'Pulls and 2 similar-sized conventional competitive dump trucks hauled and dumped rock in a deep valley... built a fill for the roadway, 125′ high, over an 8½′ x 418′ culvert. The new highway cuts

C Tournapull Rear-Dump rolls onto narrow fill, and pivots around for quick back-up to dump edge. For only about 25% extra outlay, Tony Marrazzo Construction Co., Boise, Idaho, bought interchangeable dump trail-units for their "C" scrapers. Scrapers loaded, hauled, and spread dirt; Rear-Dumps hauled shovel-loaded rock, near Nyack, Montana.

straight-across the deep ravine, and eliminates the always-dangerous curve called "Devil's Elbow".

"C's" save 2 minutes per cycle

A stop-watch time-study showed that Tournapull Rear-Dumps' extra speed and 90° turn-ability saved time in restricted loading zones... over narrow, shelf-like haul-roads ...and at tight dump areas. Chart at right shows typical time study (in minutes) for one phase of the job.

"Muck-movin' sons o' guns"

Marrazzo superintendent says, "These Tournapulls are muck-movin' sons o' guns... they'll get under a tighter spot than (competitive unit). I like their maneuverability in narrow cuts. They work in and get loaded quick... and this is some of the roughest going there is!"

Rear-Dump operator reports, " 'C's' are good maneuvering rigs... so far ahead that our dump-truck type haulers aren't even in it. The Electrotarder pulls you right down — no matter how fast you're going — without touching the regular brake pedal. It's a real brake-saver."

Contact us for complete details on how Tournapull Rear-Dumps and scrapers — or combination of both — can cut your earthmoving costs.

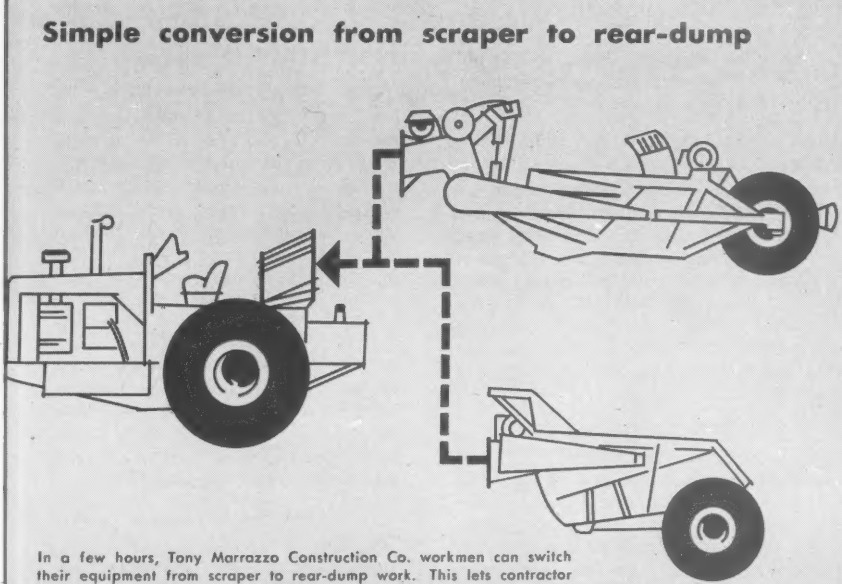
	Competitive Dump-trucks	Tournapull Rear-Dumps	"C's" saved
LOAD, 5-2½ yd. dipperfuls	1.97	1.91	0.06
MANEUVER, at shovel	0.84	0.52	0.32
HAUL, 1470' down and up grades to 18%	3.04	2.36	0.68
MANEUVER, at fill	1.22	0.46	0.76
DUMP	0.28	0.21	0.07
RETURN, 1470'	2.62	2.51	0.11
TOTAL CYCLE, average	9.97	7.97	2.00

On this narrow ledge, 2 of Marrazzo's C Rear-Dumps and 2 competitive dump trucks were each loaded with five 2½-yd. buckets of blast-rock. Restrictive terrain temporarily made it necessary for loaded haulers to back up to 40' wide turn-around before starting haul.

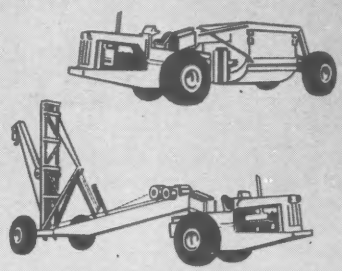
Hauling thru cuts previously carved-out, loaded Tournapulls attained speeds to nearly 30 mph, averaged 7.08 mph from start to stop on 1470' trip to the fill. Haul road presented a continuous succession of grades varying from 18% favorable to 10% unfavorable on the haul.

CPCR-1206-H

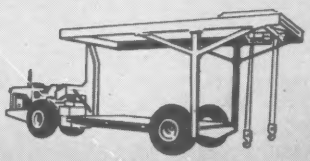
Simple conversion from scraper to rear-dump



In a few hours, Tony Marrazzo Construction Co. workmen can switch their equipment from scraper to rear-dump work. This lets contractor take advantage of more and bigger job-opportunities. He keeps his prime-movers working and earning all thru an extended season.



Both scraper and rear-dump units use same wheels, tires, brakes, and electric controls. No special tools or equipment are needed to make the change-over. Same prime-mover can power other interchangeable tools: bottom-dumps, lift-and-carry crane, and flat-bed.



LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

WHERE QUALITY IS A HABIT

Northgate Shopping Center at Memphis, Tenn., recently completed by Commercial and Industrial Construction Co. Adams 660 did all grader work on company's new 23-acre Southgate Shopping Center in less than 60 working days.

Rolling heavy clay hauled by 6 scrapers, Adams 660 grader spreads and levels fill at better than 6 mph.

How many...and what size graders would YOU use if you had:

- A 23-acre land-levelling job
- 400,000 cu. yds. of dirt to move
- 60 working days to complete
- 6 prime-mover scrapers
- 7000′ dirtmoving cycle

On this shopping center project, a Memphis, Tennessee company used just *one* grader... an Adams 660, working 11 hours, 6 days a week.

The Commercial and Industrial Construction Co., an affiliate of Union Realty Company, one of the largest industrial developers in the South, handled site development on the company's new Southgate Shopping Center at Memphis. Less than 60 working days were allowed for the grading.

Big grader works fast

To handle the grading, Oscar Moody, Superintendent for C.&I.C. Co., used an Adams 660. From previous experience with the Adams grader on the company's Northgate Shopping Center, he knew the big "660" could handle the grading unassisted.

Grading scraper-dirt on the fill, the Adams spread up to 8,000 yards per day. Heavy clay boiled off the blade at grader speeds to 6.7 mph. Surface-cutting and ditching was done in 2nd and 3rd gears at 3.2 to 4.7 mph. "660" hustled from one assignment to another at speeds to 26 mph.

7000′ cycle in 20 minutes

The Adams 660, working in hard-packed clay, kept 7000′ haul-and-return roads smooth for steady scraper operation... let rigs cut cycle-time, haul in 3rd and 4th gears. Watching, you could see the "660" dig-in without hesitation, "take-off" down the road, blading at 4.7 mph. After a quick turn-around, it graded the return route... completed the circuit in less than 20 minutes.

Bought machine after competitive demonstration

Philip and Jack Belz, owners of C.&I.C. Co., knew what they were getting when they bought the Adams. They bought after competitive demonstration on one of their jobs. After comparing several machines on the same work for speed, power, and ease of operation, one machine stood out... the Adams 660. The Belz's proved to their satisfaction — just as you can — that with 8 forward, 4 reverse, and 3 optional creeper speeds, Adams *actually produces up to 30% more work.*

Superintendent Moody sums it up this way: "You need a man to do a man's work! It's the same with graders. Adams is the most powerful. It will do more work than any grader we tried. It's completely dependable, and does all we ask of it!"

Makes best use of production time

Mr. Moody is right. The major reason Adams wins in competitive demonstrations is that the 150 hp "660" (as well as other heavy-duty Adams graders) provides more gear-ratios at which full engine-power can be used ... to cut deeper ... to push more dirt faster than other graders. Adams graders gain up to 5000′ per hour in production travel. Creeper gears (optional) extend working range in very slow speeds, provide extra push-power, more accurate control, for precision work. Reverse speeds to 13.7 mph save time for forward, productive blade-work. Top speeds to 26 mph cut non-productive travel time.

See the difference

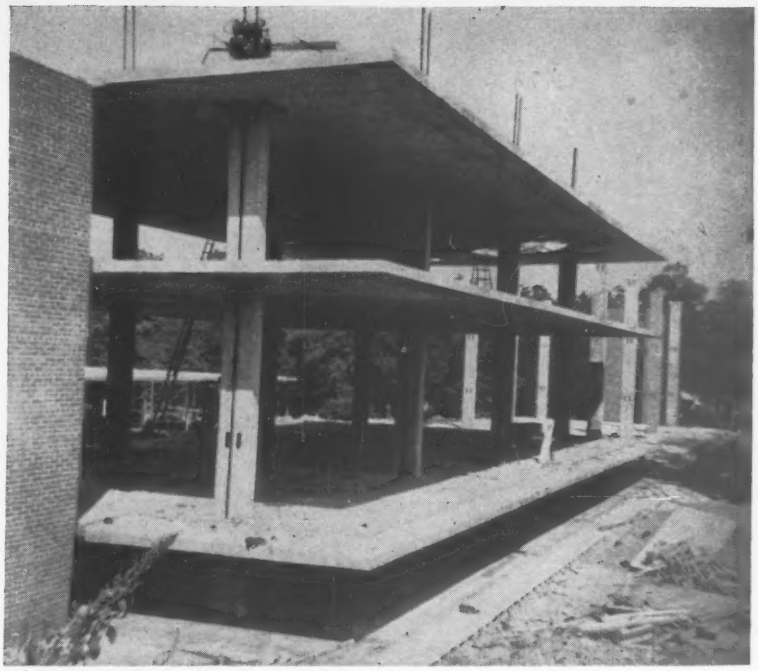
Why not do as Commercial and Industrial Construction Co. did? Compare the work of an Adams against that of any other grader. Call us and we'll be glad to demonstrate.

Adams—Trademark AG-1087-B-b-6

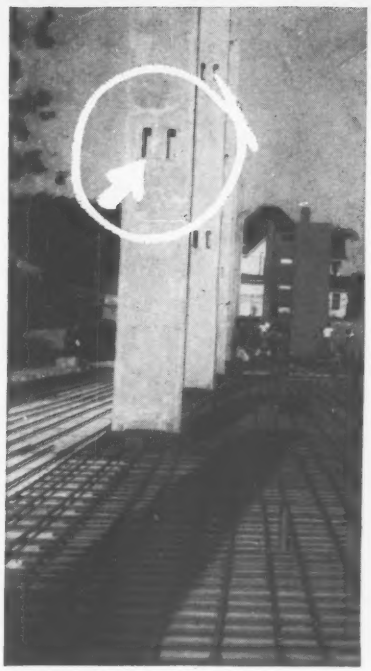
LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

WHERE QUALITY IS A HABIT



Hydraulic jacks lift the slabs for a three-story building at Wingate Junior College, Wingate, N. C. Each slab was cast on the surface of the slab curing below.



Keyholes (arrow) are located at each floor level to connect slab to columns.

Lift-Slabs Connected to Precast Columns

The precast concrete roof and floor slabs for a 3 story dormitory building at the Wingate Junior College at Wingate, N. C. were lifted and supported on concrete columns instead of steel as has become commonplace. To provide a fireproof and completely concealed slab-to-column connection under these circumstances required specially designed concrete columns and steel collars.

When the slabs were lifted into position, connection was obtained by inserting steel keys into the column holes and extending them into the slab collar on both sides of the column to support the floor slabs.

Dimensions of the concrete columns were limited in one direction to 10½ in., since the hydraulic jacks used in the lift-slab construction had a maximum lift-rod spacing of 15 in. To obtain the necessary column section, the column's dimension in the other direction was increased to 22 in.

At each floor level, the columns were pierced in the short dimension by keyholes 2¼ in. wide by 9 in. high. Main reinforcement in the columns consisted of 12 No. 9 bars but this number was increased to 18 No. 9 bars around the keyholes. Steel base plates 1 x 3 x 10½ in. were placed at the bottom of these holes.

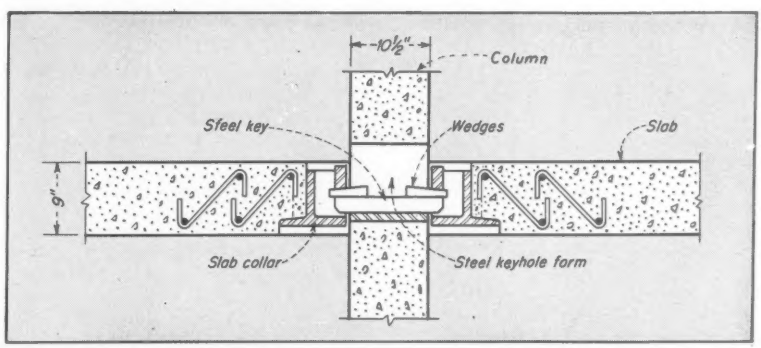
Steel collars were slid down over the columns and the slab reinforcement welded to them before concrete for the slab was placed. The cast steel collars were designed as for steel columns, except for special recesses and holes which were provided to receive the keys.

When the floor slabs were lifted to final position, the keys were inserted through the column keyholes from above the slab and into the opposite collar keyhole. The keys were then lowered into a horizontal position and pushed backward so that they were projecting into the collar equally on both sides.

Steel wedges were then inserted in the keyholes so that they filled the space between the top of the key and the collar, taking care of any discrepancies in the column, keyhole and collar levels.

The steel keys used had a 2x2 in. cross section and were made of high-carbon steel with a tensile strength of 90,000 psi.

After the slabs were connected to the columns, all opening at the keyholes and a ¼ in. gap between the columns



Connection is made by passing steel keys thru the column and into the slab collar. Wedges are inserted to level the slab. Connection was made rigid by grouting openings.

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with the *MOSTEST*

Fastest — in 23 minutes you're up in the air with your first load. 23 minutes from trailing to elevating.

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BUCK EQUIPMENT CORP.
720-E Anderson Ferry Rd., Cincinnati 38, Ohio

and collar was filled with an expanding grout so that a rigid connection was obtained. Concrete applied later covered the bottom of the steel collar to make a fireproof, concealed connection.

When steel columns are used in lift-slab construction, the steel extending above the roof slab to provide room for the lifting jack operation is cut off flush with the roof when the lifting is finished. This, of course, was not convenient with concrete columns; so removable steel jack supports were made. The supports were bolted to the top of the columns and distributed the lifting load over the top area of the columns.

The concrete columns, 27 ft long, were precast in a horizontal position to facilitate the forming of the keyholes. Two 6 x 4 x $\frac{3}{8}$ in. angles were welded to exposed reinforcing at the base of the column. Holes in the angles were provided for anchor bolts and leveling nuts. After the columns were erected, leveled and plumbed, the space between the columns and footings were grouted and the concrete for the first floor placed tight around the columns.

The first floor was used as a casting surface for the second-floor slab. The third floor and roof slabs were formed over the slab curing below. Each slab was then lifted into place, beginning with the upper floors and roof, the lifting rods passing down through the collars of each slab already in position.

The dormitory structure consists of two equal parts separated by an expansion joint. Eight columns spaced 24 ft c-c each way support the slabs in each half of the building. Outside walls are porcelain-enameled steel panel. Interior partitions are of 6 in. masonry block.

Cost of the structure was about $11.84 psf.

The building design was done by Croft and Hammond, architects. Walter Preimats was the structural engineer. Both are from Asheboro, N. C. Dickerson, Inc., Monroe, N. C., was the general contractor, and the lifting was done by Eastern Lift Slab, Inc., Richmond, Va.

Pre-Bid Conference Called To Settle Contract Size

The Seattle Board of Public Works, at the request of City Engineer Roy W. Morse, will hold a pre-bid conference with interested contractors and suppliers before proceeding with its $11 million Tolt River water supply project.

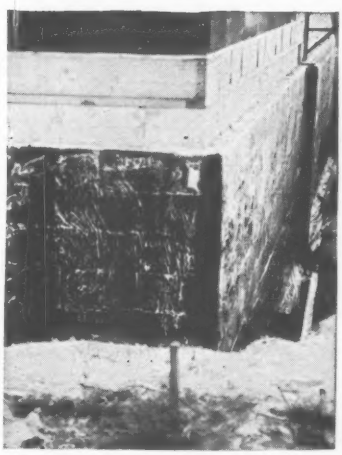
The conference will be helpful in ascertaining sentiment of the construction industry as to the best methods of carrying out the project, which will involve construction of a dam and a long pipeline, Mr. Morse said. Contractors will be asked whether they favor one contract for the entire pipeline, or dividing the project into several contracts.

How to **keep water out** of concrete block foundation for life of building

Effective water-proofing of concrete block or concrete foundations has long been a builder's headache. Here is an inexpensive, simple, life-long solution:

1. Mop outer foundation wall with regular tar.
2. Apply 4 mil VISQUEEN film. For an 8 foot wall use 4 foot center fold to avoid seams. Drop film to bottom half of wall after application of top half.
3. Brush down to achieve tight fit.
4. Backfill. VISQUEEN film is inert and will last for the life of the building.

For the name of your nearest dealer write the VISKING Company.



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Only VISQUEEN has the benefit of research and resources of the VISKING Company.

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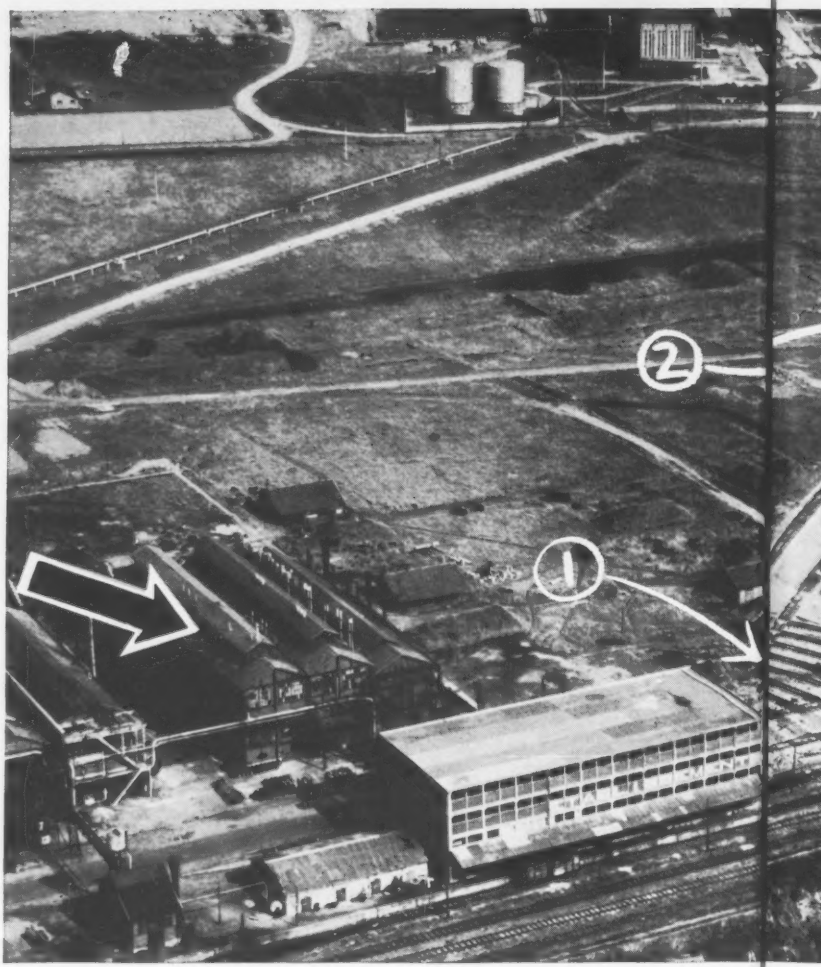
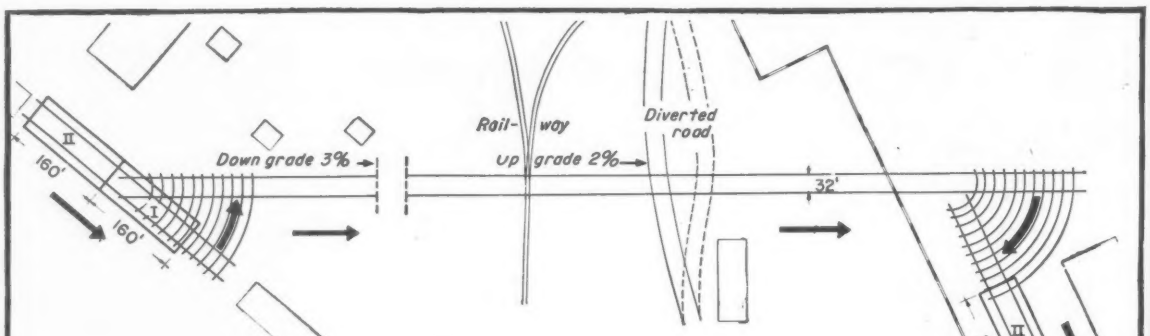


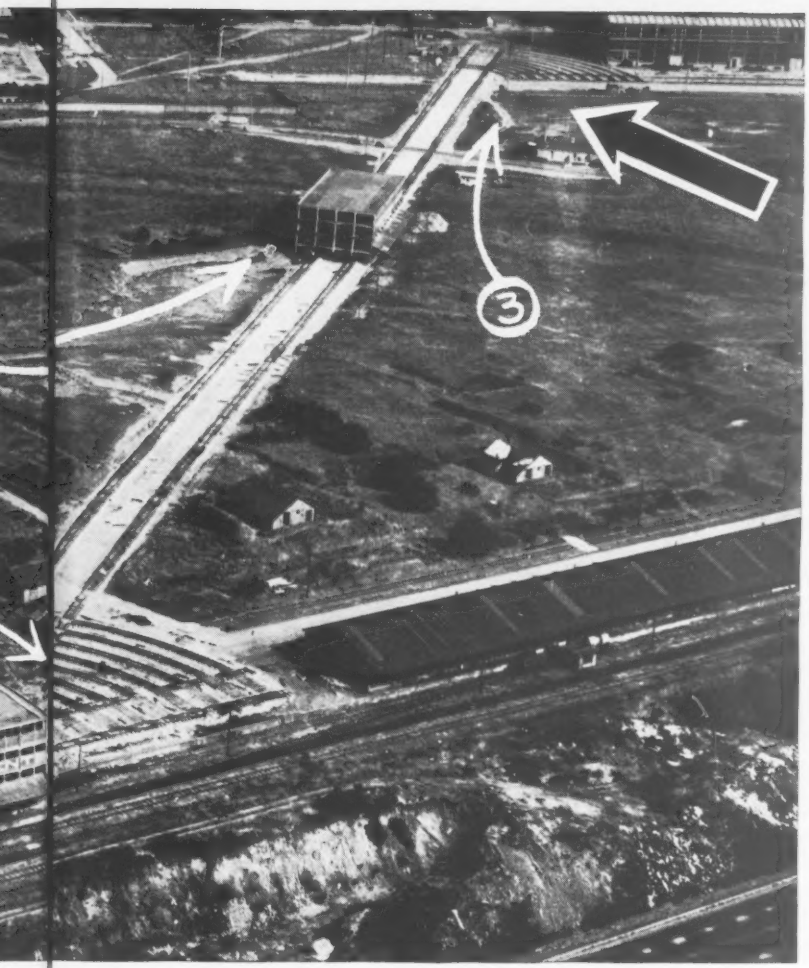
From Here . . .

Network of rails (1) marks original site of four-story reinforced concrete building (2) and traces the path followed by the structure. First it was rotated to the main track; then it was rolled forward. The building pictured enroute is only half the entire structure. The other half, shown still on the original site, followed later.

Four-Story Warehouse Journeys Half Mile



ROUTE included rotations and grades. The building, shown in both the old and new positions, followed the heavy arrows.



. . . To Here

New site (3), shown overlaid with rails and already for the arrival of the warehouse, lies nearly a half mile from the starting point. As the curved rails indicate, the end of the move involved a rotation similar but opposite in direction to that at the beginning. New foundations, although not visible in photo, had been constructed at this stage.

ilo New Site

The prospect of moving any building is enough to make most builders quail. Imagine the formidable task of transporting a four-story, reinforced concrete warehouse half a mile. That was an assignment handed to the Paris branch of Christiani & Nielsen.

Moving buildings is familiar work for this Danish firm of engineers and builders. C & N began in 1930 to fit house-moving jobs in between the company's better known activities, the design and construction all over the world of dams, bridges, marine and harbor works, buildings and other heavy structures.

• **Old way cost too much**—Until 1950 C & N had stuck to traditional moving methods, which required the construction of very rigidly supported railways to prevent the destructive moments that support deflections would cause in building members. That year, however, the Paris branch took on a job that brought about a critical re-examination of accepted moving techniques. The contract called for relocation of a whole residential district over a distance of several hundred feet. The route involved inclines, curves, and rotations; and the usual system of rigid supports appeared to be altogether too expensive.

The Paris branch appealed to the home office in Copenhagen, and the home office tossed the problem to the Hague branch (the Netherlands), which had had considerable heavy-moving experience in placing precast tunnel sections.

Out of this interbranch cooperation came a system of supports that actually supported a house at four points—the corners—but behaved statically like a three-point system.

• **Like a milking stool**—The advantage of three-point support (when the points are not in a row) is, of course, that support deflections do not create moments. C & N achieved this result by linking two of the four supports hydraulically. Joined in a single fluid system, the jacks at these two points extended and retracted their pistons reciprocally, each exerting a constant thrust.

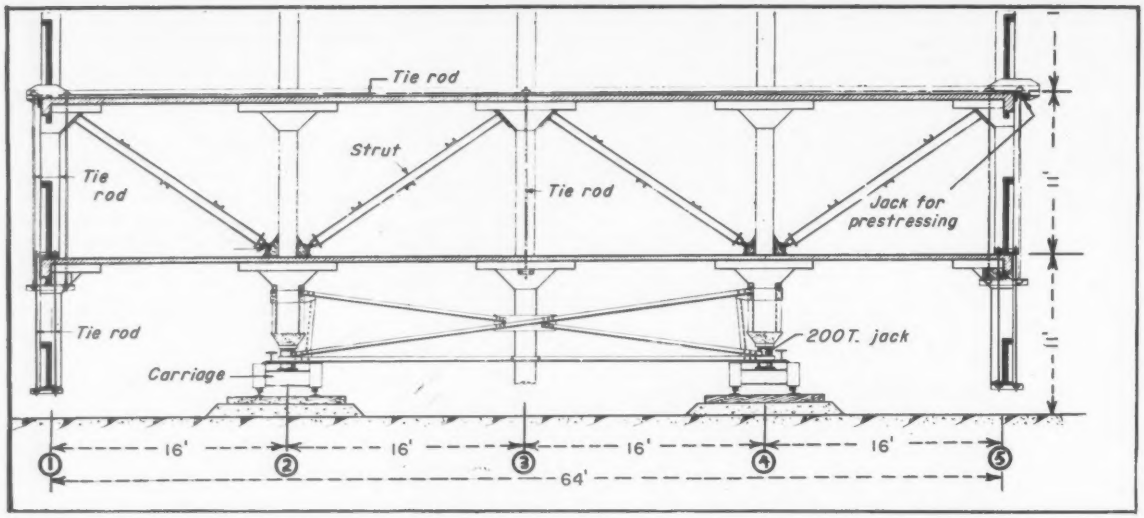
• **Imaginary third support**—Somewhere between the jacks (halfway when they were identical), the theoretical resultant of the two thrusts acted. This was the imaginary third support. It was like an invisible ball-and-socket joint. If the track dipped under one of the two linked supports, the jack piston on that side extended, the one on the other side retracted, and there was no change at all in the relative elevations of the two building corners. When a change did occur in the relative elevations, as was the case when one of the other two supports—the unconnected pair—dipped or rose, the connected jacks made the adjustment automatically by allowing the building to rotate about the imaginary support.

• **Same idea for warehouse**—The warehouse was by far the biggest building C & N had ever had to move, and it had to be supported at many more than four points. The same principle was applied, however, as in moving the smaller buildings; that is, support points were linked hydraulically to function as a three-point system.

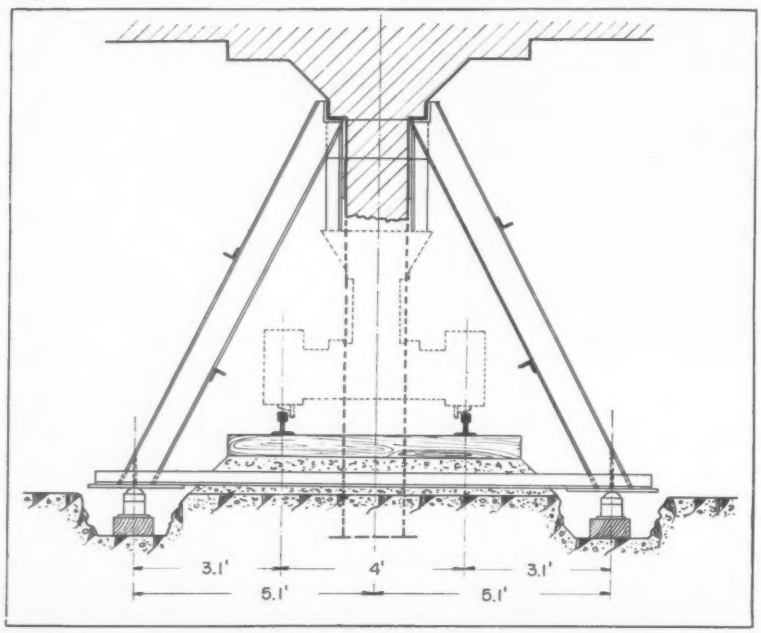
The warehouse is of reinforced concrete flat-slab construction. In plan, it is 65 x 320 ft, with a 16 x 16 ft column grid. Thanks to an expansion point dividing the structure at mid-length, C & N were able to treat it as two separate buildings 65 x 160 ft, each weighing an estimated 2,500 tons and supported by 55 columns.

The new site was about 2,500 ft from the old in a direction roughly 40 deg counterclockwise from the longitudinal axis of the building. And in its new

. . . Each of the supporting columns had its own four-wheeled truck



TRUSSING the second story by adding diagonals and tie rods cut number of supports from five to two at each column row.



SUPPORTING COLUMNS in the ground story were shored up on inclined struts, then cut off below the strut to permit the installation of rails and flanged-wheel trucks.

READY TO ROLL the building is hydraulically supported on trucks. Fluid connections keep track deflections (visible in photo) from altering column reactions.

location the structure would be rotated about 25 deg clockwise with respect to its original position. To move it obliquely along the most direct path would have been both impossible (other buildings were in the way) and undesirable (too many tracks would have been required).

C & N decided therefore to rotate the first section 40 deg counterclockwise to point its axis in the direction of travel, move it parallel to its axis to the new site, rotate it clockwise 65 deg (which would orient it 25 deg clockwise from its original position), and roll it into place; then roll second half ahead 160 ft to the position vacated by the first half, and repeat the procedure.

• **First, fewer supports**—The first step before doing any moving was to reduce the number of supports required.

C & N accomplished this by trussing the second story of the building at each transverse row of columns (11 rows, 5 columns each). Utilizing the third floor as the top chord, the second floor as the bottom chord and the second story columns as vertical webs, they installed steel diagonals in a W pattern of webs to complete a series of four-panel trusses. The trusses were designed to be supported at the second and fourth panel points, thus reducing the number of supports from 55 to 22.

Before converting the structure from five-point to two-point support at each truss, the concrete columns and the third floor were precompressed by means of jacks that applied tension to the steel diagonals and to horizontal tie rods at the third floor.

• **Rail trucks installed**—Prior to the prestressing operations, the 22 support-

The Surveyor's Notebook

Reporting on Unusual Surveying Problems and Their Solutions

Notekeeper: W. & L. E. Gurley, America's Oldest Engineering Instrument Maker

Salted footprints, decades old, led him to his goal

Since 1904 Andrew Nelson, dean of federal surveyors, has surveyed some seven million acres. Laid end to end these linear surveys would girdle the earth—and then some.

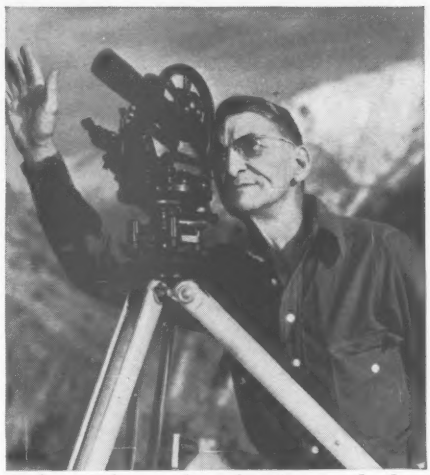
In the Great Salt Lake Desert area in 1926, Nelson had to tie his survey into the area to the north, surveyed over a quarter century earlier. *His problem:* how to find posts planted in 1870?

For Nelson, wise in desert procedures, this was no great problem. Scouting northward he found the 26-year-old footprints of a five-man crew, still preserved in salt. Following them to the lost post markers, he left his own, perhaps for future surveyors to find and follow decades hence.

Nelson has several times walked 45 miles in one day. He has used snowshoes, skis, toboggans, canoes, horses—and riding 60 miles in a day, muleback, is all in a day's work for him.

As a follower of the surveyor's "straight and narrow" for half a century, he has worked in heat that burst thermometers, and cold bitter enough to quickfreeze human lungs. During his wilderness work he has feared only one animal and claims a speed record for the mile on snowshoes fleeing from the threat of a pack of wolves.

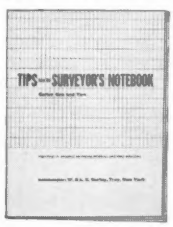
Surveyors often come upon dramatic evidence of past history. Nelson's most interesting find was three wagons, abandoned by the ill-fated Donner Expedition in 1846. In the old wagon traces, the bones of oxen lay as they had been abandoned eighty years earlier—fully preserved in salt. Wheel tracks still remain for anyone to see.



Andrew Nelson, cadastral engineer and a dean of American surveyors, sights through his Gurley Telescopic Solar Transit.

As he is one of the last of a vanishing fraternity of surveyors, Nelson's views on instruments are valuable. He says: "The Gurley Telescopic Solar Transit can save countless hours when re-running a misclosure. It is invaluable for checking on precise traverses. For large-scale precision surveying, *nothing equals a Gurley.*"

"Tips from The Surveyor's Notebook": *We have collected the most helpful, most discussed pages from Series One and Two of "The Surveyor's Notebook" in one 20-page book. These valuable field suggestions will help you use your own instruments with greater success. Write for your free copy.*



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HOW TO HANDLE
WET JOBS

WELLPOINTS
ELIMINATE
SHEETING

Harbison-Walker Brick Refractory, Hammond, Ind. — *Contractor:* Consolidated Engineering & Construction Co.

WHEN A JOB-SITE is located, like this one, in the middle of a swamp —and when the water-bearing soil is a fine sand with an underlying layer of clay — it's not surprising that the contractor should figure on sheeting. Such expense, of course, runs heavy.

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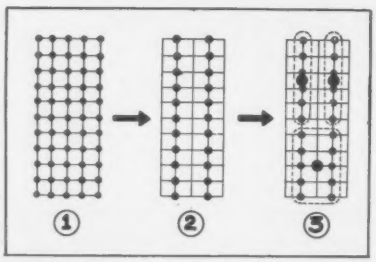
. . . Moving the warehouse cut costs in half

HYDRAULIC JACKS with 30 in. stroke, wedged to tracks in horizontal position, were used at six trucks (out of 22 total) to propel building along the tracks.



SUPPORTS were cut from 55 to 22 by trussing 2nd story, then to 3 by fluid system.

ing columns of each half of the building were shored up below the second floor by means of sloping struts brought up under the column capitals. This took the load off the portion of each column below the capital and permitted the movers to cut the columns and install rails and rail trucks.

Each of the supporting columns had its own four-wheel truck, equipped with a hydraulic support for the column. After the cut column ends were reinforced and mounted on the trucks, the sloping struts were removed. However, cross bracing was installed between the column stubs to transfer into the second floor the lateral loads of moving.

The other columns—1, 3 and 5 in each row—also were cut off below the second floor. Actually, these three were not truss members but functioned simply as suspenders, supporting portions of the second floor. Accordingly, they too had been prestressed against the tension forces to be imposed by the suspended loads.

• **Three fluid systems**—The 22 hydraulic supports were linked so as to comprise three separate fluid systems, in accordance with the principle described previously. Two of the systems, with six jacks each, were formed by installing fluid connections among the first six jacks in each of the two rows. The third group encompassed the remaining ten jacks, five in each row.

With this arrangement, support deflections had no effect on column reactions and, therefore, no effect on stresses in the building. The effects of a dip in the track under any one carriage were immediately and automatically distributed among all the jacks in the group. The net effect was a much smaller dip of the entire section of the building supported by the group of jacks. This slightly tilted the building but—since there were only three groups—did not rearrange the distribution of loads to the supports.

• **Three sizes of jacks**—Since load distribution to the various jacks—hence, to the various columns—was predetermined by the relative piston areas, it was necessary to select jack sizes accordingly. C & N used three sizes: 200 ton jacks under the nine interior pairs of columns; 150 ton jacks under the pair at the end wall; and 100 ton jacks under the pair at the expansion joint (here there was no wall).

At rail intersections, where the direction of motion had to be changed from translation to rotation or vice versa, each of the carriages was raised off the rails and rotated to the new direction. Then the new rails were installed and the carriage lowered. The carriages were raised and lowered by special jacks, which rested on concrete foundations.

• **Jack propulsion**—Forward motion (or lateral motion during rotations) of the building was effected by six 50 ton jacks, with a stroke of 36 in. Wedged to the rails the jacks propelled six of the carriages.

Moving the warehouse cost perhaps half what it would have cost to erect a new one. At least as important, the move took considerably less time than erecting a new building.

With smaller buildings, the cost advantage diminishes—at least in France—dropping to zero for small brick dwellings. Nevertheless, the acute shortages of materials, labor and housing in that country have made it worthwhile to move a great many small buildings.

Craftsmanship

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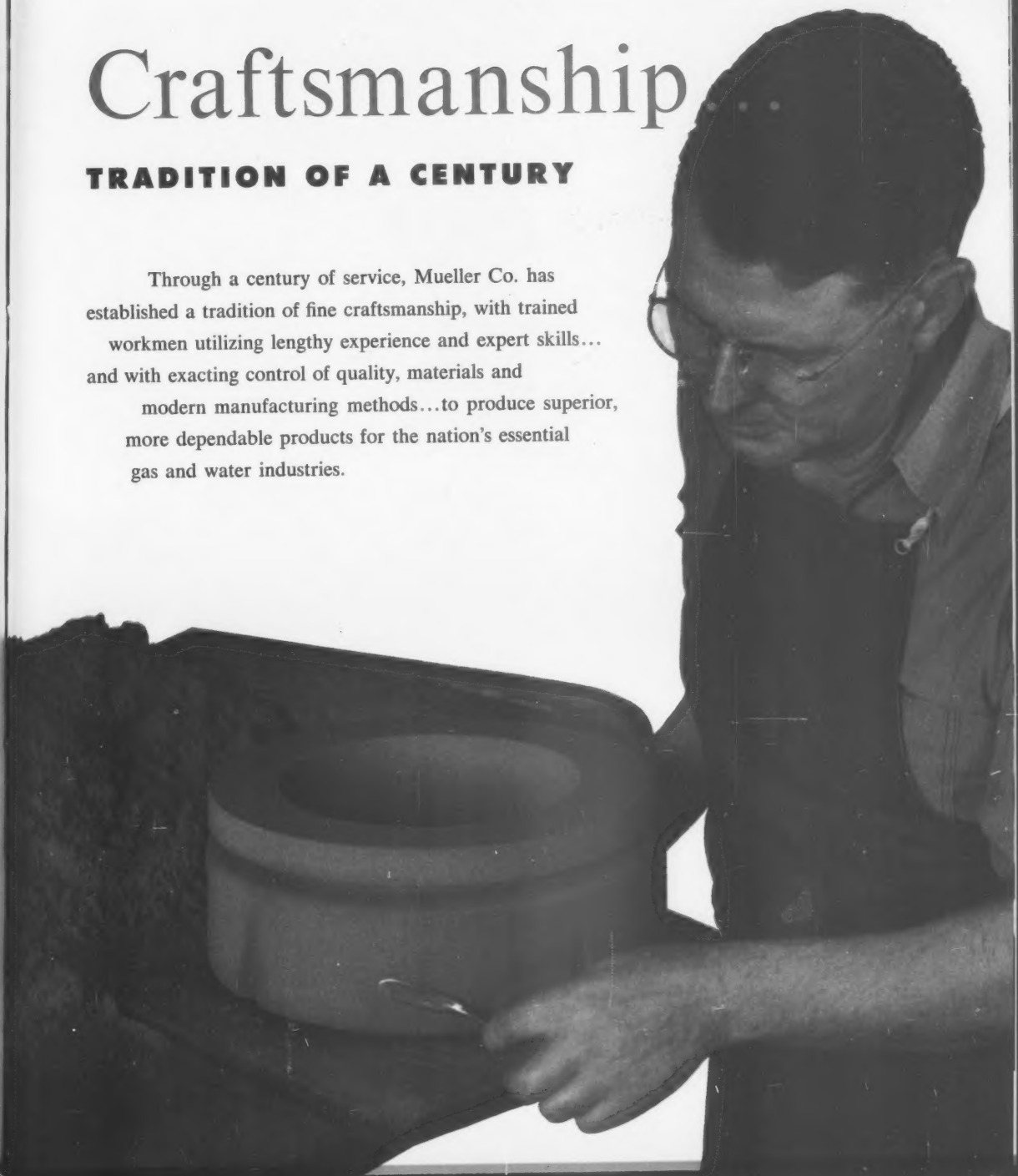

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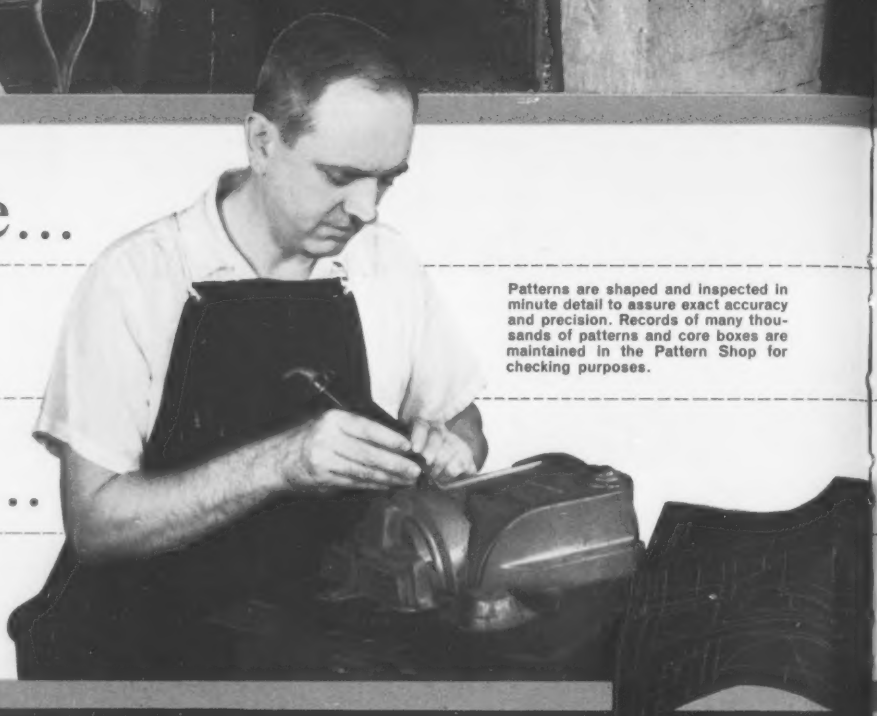
Expert core men, with skilled hands, call on experience, craftsmanship and unerring skill to shape cores with exacting detail, even to the grain of the sand.

Patience...

Pride...

Perfection...



Patterns are shaped and inspected in minute detail to assure exact accuracy and precision. Records of many thousands of patterns and core boxes are maintained in the Pattern Shop for checking purposes.

Testing the alignment of plates used for making brass and iron castings. Accuracy to .001 of an inch is strictly maintained for perfect molds.

Nimble fingers of this master craftsman operate a ground key lapping machine, producing Mueller stops that must have accuracy to .001 of an inch.

Experienced ladlemen jockey ladles into position to receive white-hot liquid brass. Furnaces melt 2,000 pounds of brass in an hour.

Modern tools are of the utmost importance in fabricating an extension stopper fitting which must be accurate for long-lived ease of operation.

Precision machines cutting gleaming metal to microscopic tolerances... turning conveyor lines carefully carrying partially completed products to assembly points... busy men of many talents adjusting instruments, reading gauges, skilfully performing their work—this is Mueller quality in the making!

Within this vast array of men and machines, every movement has a purpose... each and every man is thoroughly trained for his work, takes great pride in carrying it to perfection. Each part is carefully examined and tested to insure a product of highest quality and the finest workmanship possible... a product that will give long, safe and trouble-free service.

Never-ending patience and great pride in his work guide this machinist as he manufactures thousands of small parts used in Mueller products.

A skilled workman with a steady hand and a "fire-proof" thumb "wipes" a lead gooseneck joint to mirror-smooth perfection.

Working with extreme care, an experienced craftsman checks each component part of a drilling and tapping machine, insuring trouble-free service, efficient operation for many years.

Extensive testing of the Lub-O-Seal, under the scrutinizing eye of an engineering expert, gives the product a final approval. This Lub-O-Seal lost no efficiency after 1,000 high pressure tests.

Watchful eyes and precision machines combine to complete an exacting cut in a stem that will become an integral part of an ever-dependable Mueller Gate Valve.

Mueller fire hydrants are tested under high pressure to provide proof of the dependability of a product that must always be ready for instant service.

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When the finished unit leaves Mueller Co., the skill, the care and the quality built into each product must meet one final test . . . a test in which Mueller products have demonstrated superior quality time and time again.

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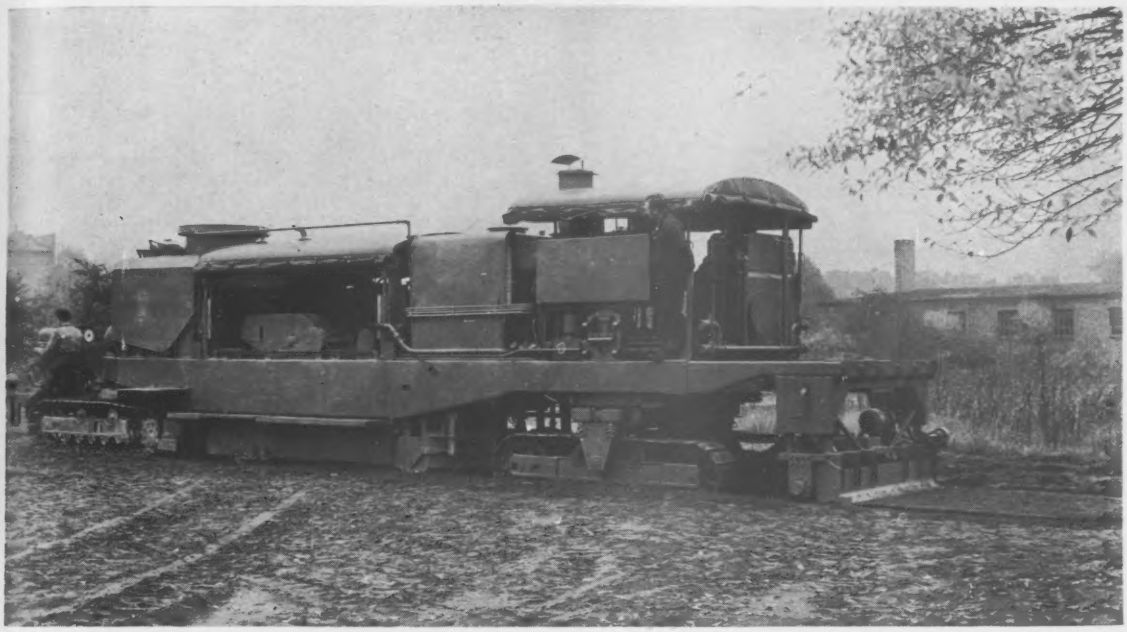


For Secondary Roads, German Industry . . .

Develops One-Pass Road Maker

A road-laying machine that produces 656 to 985 lin ft of concrete or asphalt-treated secondary road per hour in one working operation, and using existing soils as aggregate, has been developed in Germany.

The tractor-pulled 36 ft 5 in. long vehicle, weighing about 32 tons, moves on articulated tracks. Grippers break the ground in front of the vehicle to a depth of 12 in. and lift the soil into the machine. Here the material is crushed and mixed with water and cement (or asphalt treated) and then distributed as a "road" behind the device. Roadways up to 8 ft, 3 in. in width can be put down.

The soil stabilization mixer, known as "'Sawoe," can be used for stabilizing soils using either bituminous binders or cement. In both cases the machine is said to produce a homogeneously mixed, and completely level stabilized layer in one operation. Developer is Edward Linnhoff, of Berlin–Templehof, Germany–a long-time machinery manufacturer.

The machine consists of the stabilizing mixer and the towing tractor, which can be disconnected and used separately. These two units together form what is termed the "basic equipment". While working, the mixer forms a semi-trailer supported on the tractor. If it is to be moved a considerable distance, the mixer can be converted into a three-axled trailer, mounted on sprung axles and pneumatic tires.

All types of soil stabilization work can be carried out with the "basic equipment", according to the manufacturer, but in general, a distinction must be made between stabilization using tar or bitumen and stabilization using cement (soil-cement).

• **Technical considerations**–First step in using the machine is an accurate analysis of the soil, to determine the most suitable additives.

If bituminous stabilization is indicated, the amounts of binder, and also the quantity of water which normally has to be added to standardize the moisture content of the soil, must be considered together with any solid materials that might be required to insure that the finished stabilized layer has an optimum strength or density.

For cement stabilization water, cement, and in some cases mineral materials, the sizes of which must be determined for any particular application, are added.

According to the designer, it is possible to supply the binding materials required for bituminous stabilization in accurately controlled quantities ranging from 5½ to 37 lb per sq yd, and water at rates ranging from ½ to ⅘ gal per sq yd to give the normal moisture content.

When stabilizing with cement, the machine will automatically supply water at rates ranging from 2 to 10 gal per sq yd.

If boulders or other foreign bodies such as cables or rails are apt to be present in the area, they must be cleared.

• **Operation**–After the roadbed has been prepared and any required aggregates placed, the "Sawoe" machine stabilizes the surface at speeds of between 6 and 52½ fpm. Generally, this speed will be from 10 to 16 fpm, and must be selected in particular cases to insure good mixing with the soil characteristics and depth required.

Where the work starts with the laying of shoulders, or where the first strip is laid directly in the road bed, the

LIQUIDS NEEDED in road making are fed to machine while it works.

tractor driver steers by means of carefully located surveyors' poles. These poles are removed by a man just as the tractor reaches them.

When stabilizing a strip next to an existing strip, the driver can, from his low position on the tractor, make certain that the new strip butts directly against the existing one.

Since in most cases the work involves a number of adjacent strips to be stabilized, or, as on air fields, a large number of strips succeeding each other, special attention has been paid to the question of turn-around. No shunting or turning of the machine is required.

At the end of each strip the mixing hopper is raised hydraulically, and the machine moved to one side clear of the stabilized strip. Then the rig simply backs up to return to the starting position, and is ready to lay the next strip. For this operation the tractor is locked in the straight-ahead position, and the operator standing on the rear of the machine controls it by means of the rear caterpillar tracks—which are now the leading tracks—and which can be steered.

The mixing hopper carries the three working shafts in fully-enclosed dustproof bearings. These rollers are driven by single precision roller chains, located in a completely enclosed casing, and which are provided with guides to fix their positions.

The first shaft in the mixing hopper is a high-speed cutter shaft, capable of breaking up small stones.

The two following shafts conform to those in a twin-shaft mixer, mixing the material that has been loosened by the cutter so that it is completely homogeneous.

If required by the working width and the nature of the soil, a distributor with a scraper board can be fitted behind the machine.

• **Liquid additives**—In addition to the mixing equipment, the mixing hopper has provisions for supplying water, and bitumious or cement binder. For bitumens, the hopper is equipped with two sets of spray nozzles. The amount of binder added can be accurately adjusted by means of precision measuring instruments.

The binder is drawn through hoses from a truck running beside the mixer and is pumped into the spraying pipe by a pump with a maximum capacity of 65 gpm, mounted on the mixing hopper. Water required is supplied by a second pump having a capacity of 110 gpm, and delivering into a second wide-spray sprinkler unit.

In the case of cement stabilization, the water is again supplied by the water pump, which delivers to the second sprinkler. In view of the large quantities of water required for cement stabilization, it is always necessary to insure that an adequate supply is available at the site.

• **Solid additives**—Small quantities of cement, amounting to a maximum of 18 lb per sq yd, can be loaded into the cement container a sack at a time over the full working width by means of the special metering device.

Where quantities exceeding 18 lb per sq yd—up to 90 to 130 lb per sq yd—are to be added, the cement must be supplied in enclosed cement containers. Like the tank trucks for bituminous binders, these cement containers are driven along beside the stabilization mixer while it is working, and the bulk cement is transferred by means of an air compressor fitted on the mixer, which passes the cement into a buffer storage compartment.

The buffer storage compartment, which has a capacity of 4 to 5 tons of loose cement, is mounted on the mixer above the metering equipment.

• **Width of layer**—The normal width of a single pass of the machine is 6 ft 7 in., the maximum working width is 8 ft 3 in. In both cases, the four caterpillar tracks of the machine will run on the road bed, the front tracks on the tractor passing over the soil to be treated, while the width of the rear tracks can be adjusted to suit the width of the layer to be stabilized.

When working at normal width, the mixed material is discharged from the full width of the mixing hopper. The rear caterpillar tracks run on either side of the stabilized layer, making the total width of the machine in this case about 10 ft 8 in. The overall width of the front caterpillar tracks is always less than 6 ft 7 in.

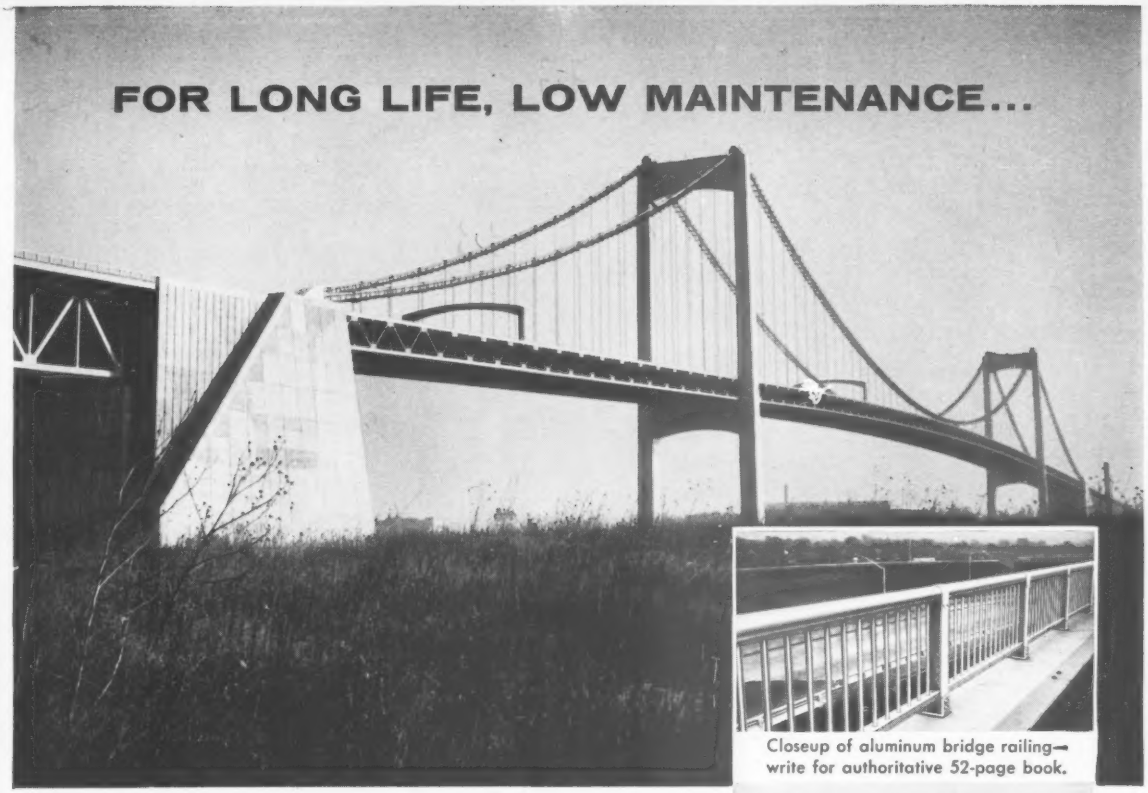
In the case of a maximum working width, mould boards are fitted at the front of the mixing hopper, each cutting a 10 in. strip on either side of the hopper to the death of the stabilized layer and passing it through side openings into the mixing hopper. In view of the larger quantity of soil passing through the hopper, the level of material within the hopper rises to about 25% above the normal. After being discharged from the hopper, this increased quantity of material spread by a distributor towed by the machine across the full width, and is accurately levelled by a scraper blade.

The rear caterpillar tracks will in this case run on the road bed beside the stabilized layer. The overall width of the machine is about 12 ft 4 in.

Both when stabilizing with a bituminous binder and with cement no difficulties will be encountered if the rear caterpillar tracks are allowed to run on the neighboring stabilized layer. (on a previously treated strip). By special devices on the side mould boards and on the distributor any working width desired between 6 ft 7 in. and 8 ft 3 in. can be adjusted.

It should be noted that for cement stabilization, the rear caterpillar tracks can also be allowed to run on the freshly stabilized surface, but where bituminous binders are used this is not possible.

• **Levelling the layer**—The working shafts of the mixer are supported on two sets of articulared tracks, so that



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any irregularities in the roadbed are transmitted to the working shafts in a much reduced form, and a very level surface is thus obtained, according to Linnhof. The two tracks form in effect the ends of a "carriage", 26 ft 8 in. in length, a shorter version of which has proved highly successful, in Linnhoff asphalt pavers.

• **Hydraulic adjustments**—The main frame of the machine is a lightweight welded steel structure, designed to mount either the tracks required for site work or the sprung axles fitted with pneumatic tires on which the machine is moved on the highway.

In order to enable the chassis, the mixing hopper, and the rear caterpillar tracks to be moved quickly and effortlessly into any position required either for working or for transportation, three separate hydraulic systems are incorporated; for height adjustment of the mixing hopper relative to the main chassis; to raise the whole machine for changing the tracks; for raising the rear tracks when these have to be withdrawn to one side to enable the work to be done, and a hydraulic power steering system.

• **Power supply**—The power supply for the mixer is provided by an eight cylinder air-cooled Diesel engine which also drives a generator. This generator supplies power to the electric motors driving the pumps that are placed some distance away from the engine. The use of electric power for this purpose eliminates all belt or shaft drives to the individual units.

The tractor itself is powered by a two-cylinder air-cooled Diesel engine.

• **Personnel**—The basic equipment requires one driver for the tractor and one operator who stands on the platform at the rear of the chassis and steers the mixer when in reverse, or alternatively tends the machinery from the hinged side platforms. Where necessary, an operator's helper may be employed.

• **Subsequent treatment**—In the case of cement stabilization the mixer can tow a separate vibrator. For bituminous stabilization the layer is smoothed and compacted in the normal way by either a rubber tired roller or a flat wheel roller.

An interval of from 15 minutes to several hours must be kept between the mixing and compacting process. The length depends on the individual conditions in each situation.

For this reason, mixer and the compacting equipment have not been built as a unit.

William Ginsberg & Associates, New York City, are architects and engineers for the new *Buffalo Evening News* building. Siegfried Construction Co., Inc., of Buffalo, is general contractor.

Steel H-Piles Driven to Bedrock

FOR FOUNDATIONS OF NEW BUILDING IN BUFFALO

Foundation work has been completed for a new steel and brick building in downtown Buffalo, N. Y., to house the printing plant of the *Buffalo Evening News*. The building will contain 158,500 sq ft of space, embodying the most modern developments for newspaper production. Contained in the $7\frac{1}{2}$ million building will be a pressroom 250 ft long and 60 ft wide with a 45 ft ceiling.

Bethlehem Steel H-Piles were used in the foundations. Over 1000 piles, varying in length from 36 to 49 ft, were driven to bedrock in this first phase of construction operations.

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On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
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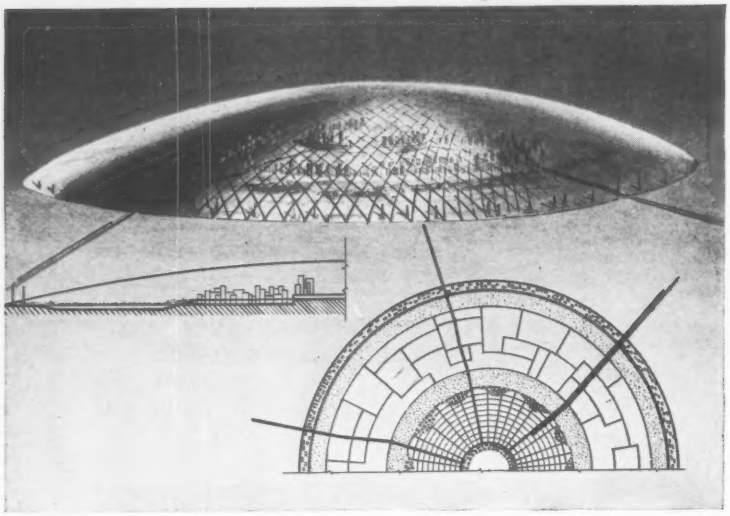
Driving Bethlehem H-Piles to bedrock.

MARS outstanding design **SERIES**

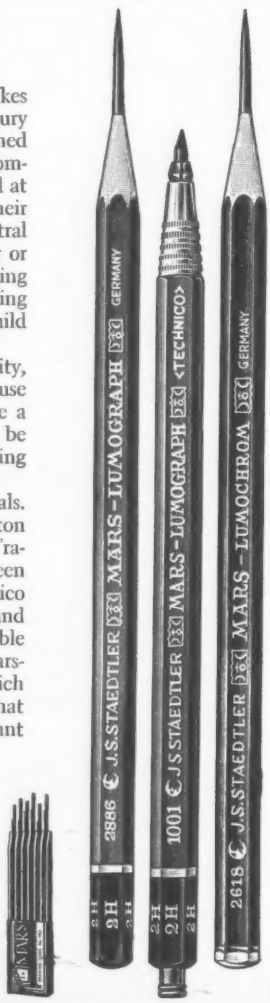


21st century city

The shallow, plastic-faced, Geodesic dome makes this city of the future look strange to 20th century eyes. But designer Philip H. Seligson has combined practical economics with creative thinking in committing his concept to paper. Industries are located at the outer circumference of the city; discharge their smoke through stacks that pierce the dome. Central air conditioning controls the temperature—winter or summer the climate is perfect. Instead of building their own four weather walls and roof, insulating them, heating and cooling them, people can build their walls merely as grilles and curtains.

No matter which of today's ideas become reality, it will be as important tomorrow as it is today to use the best of tools when pencil and paper translate a dream into a project. And then, as now, there will be no finer tool than Mars—from sketch to working drawing.

Mars has long been the standard of professionals. To the famous line of Mars-Technico push-button holders and leads, Mars-Lumograph pencils, and Tradition-Aquarell painting pencils, have recently been added these new products: the Mars Pocket-Technico for field use; the efficient Mars lead sharpener and "Draftsman's" Pencil Sharpener with the adjustable point-length feature; and—last but not least—the Mars-Lumochrom, the new colored *drafting* pencil which offers revolutionary drafting advantages. The fact that it blueprints perfectly is just one of its many important features.



The 2886 Mars-Lumograph drawing pencil, 19 degrees, EXEXB to 9H. The 1001 Mars-Technico push-button lead holder. 1904 Mars-Lumograph imported leads, 18 degrees, EXB to 9H. Mars-Lumochrom colored *drafting* pencil, 24 colors.

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Books

Geology and Engineers

PRINCIPLES OF ENGINEERING GEOLOGY AND GEOTECHNICS—by Dimitri P. Krynine and William R. Judd. 730 pp. McGraw-Hill Book Co., New York, N. Y. $10.00

This volume on geology, soil and rock mechanics, and other earth sciences as used in civil engineering is one of a McGraw-Hill series in civil engineering.

One feature of the book is the integration of geology with soil and rock mechanics to provide what is almost a new specialty. Well-illustrated with drawings, graphs and photographs, this work should give engineers and geologists, or other earth specialists, the information and background necessary for communicating with each other.

The first eight chapters contain general geotechnical information applicable to any structure; the next several chapters present the use of this information as a tool in the design and construction of buildings, bridges, dams, tunnels, runways, highways and shore structures. Earthquake design is summarized in a brief chapter, and a final chapter on the legal side of geotechnics is also included. A bibliography appears at the end of each chapter.

Books & Pamphlets

• **Swimming pools**—Sponsored and accepted as an official report by the Conference of State Sanitary Engineers and the American Public Health Association, a revised and updated 10th edition of Recommended Practice for Design, Equipment and Operation of Swimming Pools and Other Public Bathing Places is now available. 60 pages, price $1.00. Write to American Public Health Association, Inc., 1790 Broadway, New York 19, N. Y.

• **Septic tank construction**—A Building Research Institute report titled "Use of Grade Boards in Individual Household Absorption Field Trenches" says "don't". The report shows that grade boards and stakes are likely to warp and rot, causing septic tank leaching fields to settle unevenly. It suggests alternatives such as: Batter boards erected above the trench; aggregate filled to the top of the grade stakes; leveling aggregate with straight edge and level; setting drain tile with sight rod and grade string; and using a grade string in the trench. The report is available from the National Academy of Sciences, 2101 Constitution Ave., Washington 25, D. C., for $1.50.

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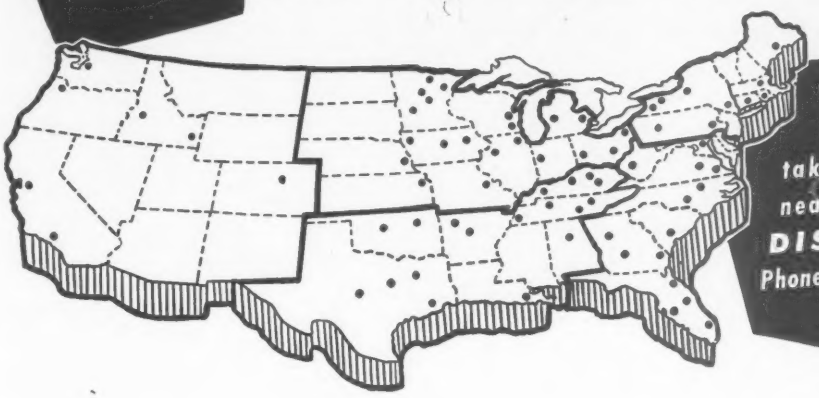

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Today's tight construction schedules demand equipment with maximum dependability. That's why production reports on grueling "round-the-clock" shifts are being watched with great interest. On jobs like this, Gar Wood dependability is paying off big . . . production is high with only minimum time out for maintenance!

Gar Wood's dependability is the result of advanced engineering from the ground up. Every part is designed for the specific function it must perform . . . designed to give you "round-the-clock" dependability. For more information, contact your Gar Wood construction machinery dealer or truck equipment distributor. Or, write direct to Customer Service Dept., Gar Wood Industries, Inc., Wayne, Michigan.

With Gar Wood "75" excavators there's less operator fatigue on long shifts. Direct manual controls retain true "feel". . . are located for instant control with less effort. Drum clutches are power actuated . . . no pressure is needed to keep clutch engaged, and release is positive. Power steering increases maneuverability.

Gar Wood Tipdozers are matched to the power and stamina of Euclid TC-12 Tractors. Hammerhead-type push beams provide maximum rigidity against side thrusts. Hardened steel pins and bushings mean longer life. Gar Wood's hydraulic unit gives operator instant control of Tipdozer blade. Hydraulic pump, valve and lines are completely enclosed and protected.

Gar Wood-Buckeye ditchers are known for their ability to stay on the job. From the ground up they're designed to dig ditch . . . each assembly is engineered for its specific function. Servicing is quick and easy because of Buckeye's unit construction, parts interchangeability, and "Quick Change" rooter bits.

DINDUSTRIES, INC. Wayne, Michigan

AND YPSILANTI, MICH.; FINDLAY, OHIO; MATTOON, Ill.; RICHMOND, CALIF.

In conical folded-plate form . . .

Concrete Roof Supplants Tent for Summer Theater

Visitors to the annual Shakespeare Festival in Stratford, Ont., this summer will find a new setting for the traditional stage fare. Gone is the tent that used to enclose the theater—bowed out for good in favor of steel and concrete.

The play's not the only thing left of earlier festivals, though. The auditorium in the new building incorporates the original concrete amphitheater. And the concrete roof strongly suggests its canvass predecessor.

Circular in plan, the 150 ft dia building is covered with an approximately conical roof, strikingly fringed around its full circumference with gable overhangs.

The new theater will be opened officially on July 1, which is Dominion Day, a national holiday in Canada. Begun last August, construction of the $1.5 million project was completed this month.

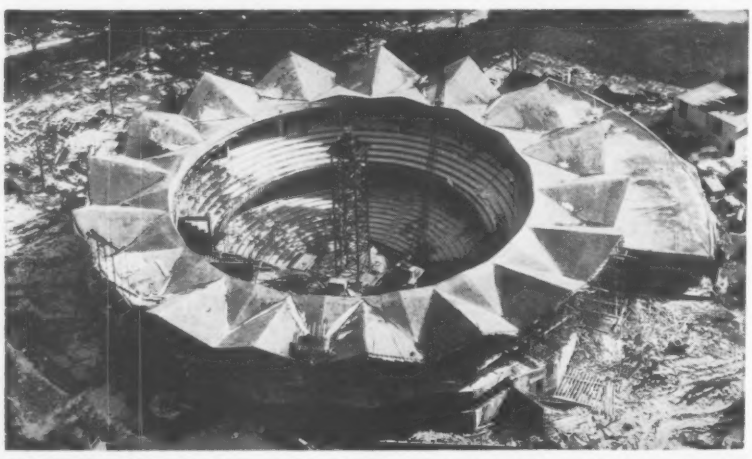
• **Roof design**—The base of the conical roof is a heavily reinforced concrete ring girder, supported by reinforced concrete columns. From the girder, 34 steel beams 75 ft long, the radial ribs of the roof, angle upward to converge on a compression ring at the crown.

The sectors of concrete roof slab between the ribs are alternately canted so that the surface is serrated by alternately recurring ridges and valleys along the radial direction.

The new structure was built around and over the old site. The existing concrete bowl, which served as auditorium seating for the original tent theater, was cut back to enlarge the backstage area. Tent columns and their foundations had to be removed. New foundations were dug and concreted against the bowl. And scaffolding and forms were assembled around the old arena.

• **Cold-weather concreting**—Since the time allowable for construction was not overlong in its entirety and included the whole winter, work had to progress no matter what the weather. Exterior operations, including concreting, continued through the cold months. The concrete for the folded-plate gable extensions had to be heated, and much of it was placed during subfreezing weather.

After completing the gabled fringe, the contractor built an earth ramp under the peripheral construction so that a crane could get inside the audi-



GABLED FRINGE was first part of roof to be constructed. Then, with tower at center as temporary support, radial steel beams were erected and the roof slab was cast.

FOLDED-PLATE construction, with 25 deg side slopes, was used for the gables.

HEAVY REINFORCEMENT is for concrete ring girder, shown partly concreted. Anchor bolts for radial roof beams may be seen on inside face of girder (arrow).

torium to erect the radial steel beams. He also constructed a temporary steel tower to shore up the crown ends of the beams during erection.

• **Interior design**—The theater was designed around the central stage, with seating for 2,200 people on three sides. No spectator will be more than 65 ft from the stage.

The building has six different floor levels, some of them extending over only small areas. The stage has a series of performance levels and balconies. The backstage area has five floors. And the orchestra "pit" is actually an upper floor or loft, located as close as possible to the acoustic center of the auditorium.

• **Ceiling structure**—The serrated-cone pattern of the roof is repeated in the auditorium ceiling structure. The ceiling, of metal lath and plaster, is supported on steel trusses arranged radially. The outer ends of the trusses rest on a perimeter wall. The inner ends are supported by a ring that hangs from the compression ring at the roof crown.

The ceiling contains a series of catwalks connecting with a 32 ft gondola booth suspended from the roof members. Just below the booth, which is nearly 50 ft above the stage, hangs the ceiling centerpiece. Made of glass-fiber panels, it will serve as an acoustic baffle as well as housing for lighting fixtures.

The theater was designed by Robert Fairfield, of the Toronto architectural firm of Routhwaite & Fairfield. Consulting structural engineers are Morrison, Hershfield, Millman & Huggins, also of Toronto.

The building was constructed by the Foundation Companies of Canada, under the supervision of Vice President J. R. Mills. Construction superintendent on the job is L. C. Racine. The contractor, a Toronto firm, erected the building at cost, as a contribution to the building fund for the theater.

ROOF BEAMS frame into compression ring, supported on tower during erection.

Trans-Andes Highway

297 mile road estimated to cost $23.5 million

Detailed studies of the projected Trans-Andean Highway from Olmos on the Pan American Highway—550.5 miles north of Lima—to a point on the Maranon River accessible to steamers, are included in a report released by the Peruvian Ministry of Development and Public Works. The Rochester, Pennsylvania, consulting firm, Michael Baker, Jr., Inc., prepared the report.

Total cost of the 297 mile highway, including improvement of the sections already constructed, is estimated at approximately $23.5 million. It is estimated that 5 to 5½ years would be required to complete the project.

The Northern Trans-Andean or Olmos-Maranon Highway, officially designated the "Mesones Muro Highway", in honor of the Peruvian engineer and explorer who first brought the existence of this low-level route across the Peruvian Andes to public attention, would provide Peru with a second land transportation route from the Pacific Coast to the Amazon Basin.

The northern route is of special importance as it will serve as a new way of access to the Maranon region of the Peruvian Amazon where petroleum exploration operations to extend over several years are being carried out. The permanent value of the highway as an outlet for the rich natural resources of the eastern foreign region and serving to open up a vast area suitable for colonization has long been recognized and during the past half century a score of projects for the construction of either a highway or railway have been presented by national and foreign interests.

A route in Southern Peru, from Cuzco to Puerto Maldonado on the Madre de Dios River, now under construction, would provide river transport by way of the Madre de Dios, Beni, Mamore and Madeira Rivers to a point on the lower Amazon near Manaus.

The projected Olmos-Maranon Highway comprises three sections.

First, from Olmos on the Pan American Highway to the upper Maranon River crossing by the Corral Quemado Bridge. This section has existed for several years and under the overall program would be widened and improved to accommodate two-lane traffic. The Maranon at Corral Quemado is navigable for small river craft, only at certain seasons of the year, and the existence of

the famous rapids in the lower reaches of the river make it inaccessible for steamer navigation.

The second section of the Maranon Highway, is now being constructed under the supervision of Peruvian Army and Public Works engineers. The report recommends that this system be continued to completion.

The third section of the Maranon Highway as proposed in the report, would extend from the second section to Delfos on the lower Maranon below the rapids, and accessible to river steamers from Iquitos and other ports on the Amazon. Delfos lies about 29 mi below Borja and 45 mi above Puerto America—two river ports which have previously been mentioned as possible terminals for the highway.

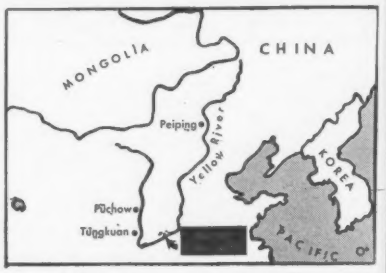
It is estimated that benefits will equal the cost before 1975 and will be four times the cost by 1982. In addition, the ultimate full development of the land made accessible by the highway will provide benefits which will be several hundred times the cost of the construction.

The only land route now existing between the Pacific Coast of Peru and the Amazon Basin is the Central Trans-Andean Highway approximately 527 mi in length, from Gallao and Lima via Oroya, Huanuco and Tingo Maria to Pucallpa on the Ucayali River, which flowing northward joins the Maranon to form the Amazon.

Big Dam on Yellow River Start of China Project

Construction of Sanmen Gorge Dam —one of 46 dams reportedly planned for China's Yellow River—is now under way.

The new dam, to be the biggest in the Yellow River long-range project, will run 2,600 ft long and 500 ft high. It



is said that storage capacity will exceed that of Boulder and Grande Coulee combined.

The damsite is located on the middle reaches of the river and, when finished, Sanmen is expected to produce 1.1 million kw of electric power. It also should make the turbulent stream navigable from the dam down to the sea.

Aluminum Prospects

Australia studies plans for $1 billion program to become exporter

Australia is studying plans that call for expenditures of more than $1 billion to turn that country into a major producer—and exporter—of aluminum.

The federal government is bowing out of the future development. Australian federal authorities will sell their share in the New Guinea Resources Prospecting Co., Ltd., to Consolidated Zinc Pty., Ltd. Other partner in New Guinea Resources is British Aluminum Co., Ltd.

The new combine will survey hydroelectric resources in Papua. If new studies confirm those that have previously been made, a large aluminum industry is expected to develop in New Guinea and Papua.

Surveys completed previously have shown that water resources in Papua are ample for a hydroelectric power installation large enough to support a major aluminum project.

Another plus factor is that some of the world's largest known bauxite deposits of suitable grade are available in Arnhem Land, Northern Territory and in the Weipa River district of Cape York Peninsula.

One string tied to the private development is an assurance that the government aluminum industry in Tasmania will be supplied with all needed quantities of alumina and bauxite "at satisfactory prices".

The Tasmanian project will continue to supply a large part of Australia's needs; the new project is expected to substantially bolster Australia's export volume.

Hamilton Wright

Colombia Hydroelectric Project Nears End

Colombia's Laguneta hydroelectric project, pictured here, will be put into service this summer.

The $13.5 million project, with a 60,000 kw capacity, is one of a series of power projects by National Public Service Corp. in Colombia's drive for 3 million kw by 1965.

Shown here are the powerhouse and twin penstocks—two steel tubes 2,800 ft long, each from 6 ft 9 in. to 6 ft 2 in. in diameter. The penstocks are fed from a concrete-lined tunnel, 7,300 ft long and of 10 ft diameter. Water source is the Bogato River, 2 miles away, with a reserve supply from nearby Lake Muna. Three generating units, rated at 20,000 kw each and equipped with S. Morgan Smith turbines, will generate the power. Gross head is 945 ft.

Engineering and construction work is being done by Gilbert Associates and Frederick Snare Corp. of New York; power plant equipment is being installed by General Electric.

How to get more storage space with BLAW-KNOX Electroforged® Steel Grating

You can get additional badly needed storage space easily and economically in your present building simply by installing platforms of Blaw-Knox Grating. It fits easily, neatly around pipes, beams and machinery without any alterations to your building.

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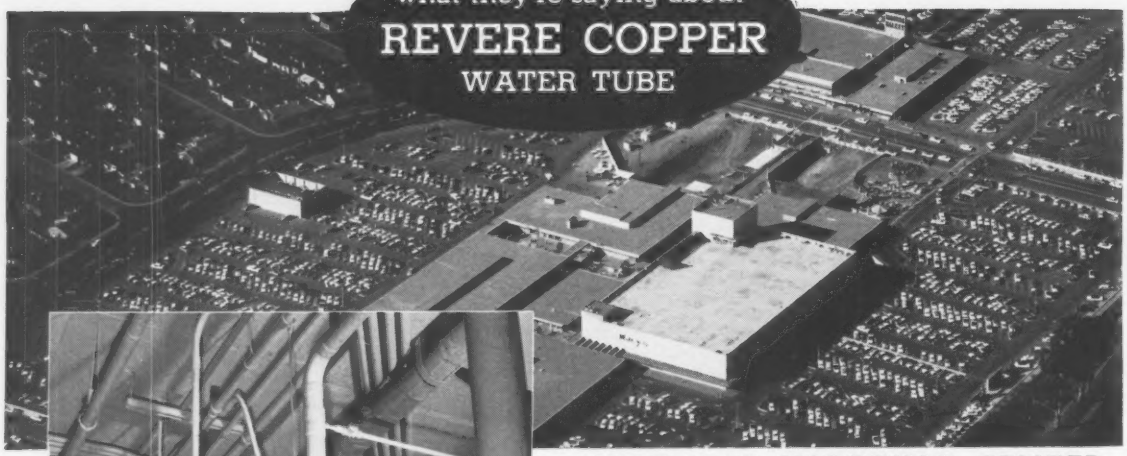
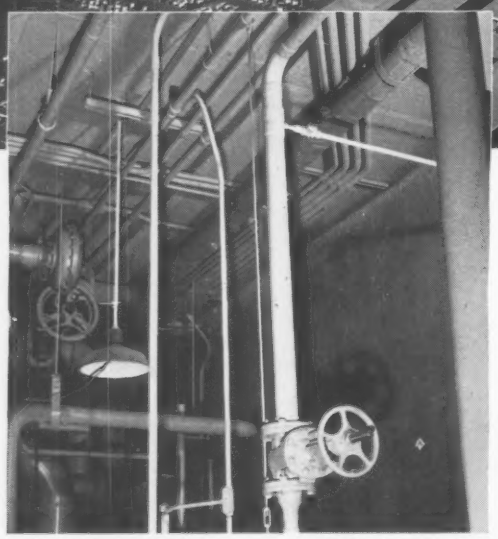
what they're saying about

REVERE COPPER WATER TUBE





THIS MAMMOTH CENTER containing over 800,000 sq. ft. of space employs 30,600 ft. of Revere Copper Water Tube from ½" to 4" diameter for its water and refrigeration lines. A section of the installation is shown above. Note neatness and compactness. Tube was furnished by Revere Distributor: TAY-HOLBROOK, INC. Architect: WELTON BECKET & ASSOCIATES. Both of San Francisco.

HILLSDALE SHOPPING CENTER

San Mateo, California

"There just isn't any other material that's as easy to work with or as economical to install"

Says, EDWARD P. HICKEY, Co-owner W. L. Hickey Sons, Inc., San Bruno, Sunnyvale, Sacramento, and San Rafael, Cal.

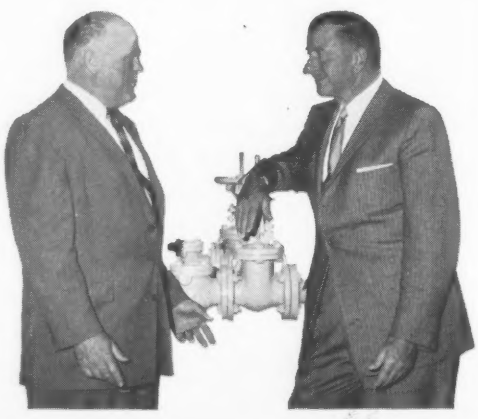
"Why take a chance on a material that can rust when a copper job costs no more"

Says, DAVID D. BOHANNON, President, David D. Bohannon Organization, San Mateo, Cal.

Mr. Bohannon, who has built over 20,000 homes in the San Francisco Bay Area, and is an originator and developer of the "California Method" of mass-production-on-the-job-site building techniques, continued, "In today's 'tight-money' market using copper water tube is more important than ever. For with copper I can give my clients a low-cost job without any sacrifice of quality."

"I've found that copper water tube, because of its solder fittings, and ease of prefabrication and handling, costs less to install than rustable materials," said Mr. Hickey, mechanical contractor.

Builder, contractor, architect, engineer . . . all agree that there is no "or equal" when it comes to copper water tube for hot and cold water lines, radiant panel heating, air conditioning lines, underground service lines, drainage, waste and vent stacks. See your Revere Distributor for your needs.



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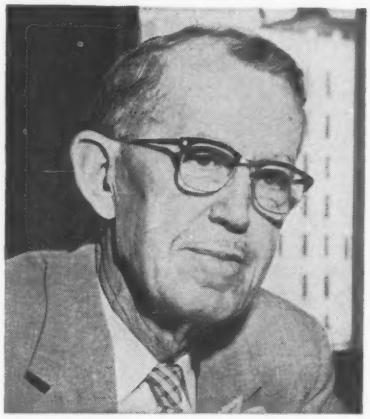


Frank E. Andrews Retires As BPR Regional Engineer

Frank E. Andrews, who had charge of location and construction of the westerly 850 miles of the Alcan Highway during World War II, retired May 31 as Pacific Northwest regional engineer of the U. S. Bureau of Public Roads.

Mr. Andrews joined the BPR in 1919 and his first job was resident engineer on construction of the Mt. Hood Loop Highway. Later assignments were in Montana, Washington, Idaho and Alaska.

The Alaska highway project, which placed him in charge of a staff of 600 engineers and assistants, constantly presented problems of constructing roads and highways over alternately freezing and thawing tundra.

He returned to Portland, Ore., in 1943 and was appointed as principal assistant to W. H. Lynch, division engineer.

He succeeded Mr. Lynch as division engineer on the latter's retirement in 1953. Later Mr. Andrews was named regional engineer and with this position he assumed authority over the federal highway program in the Pacific Northwest and the Territory of Alaska.

CHIEF OF ENGINEERS, Maj. Gen. E. C. Itschner, receives one of National Safety Council Awards from Maj. Gen. G. C. Steward (ret).

Engineers Receive 13 Awards for Safety

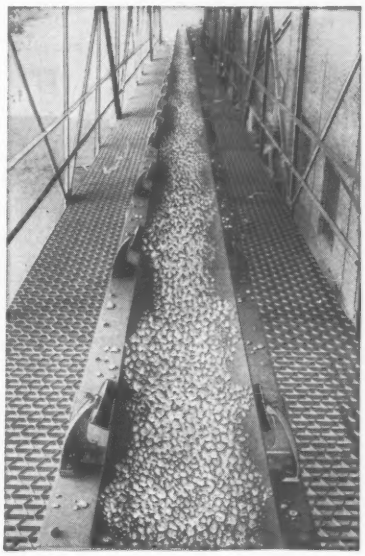
Thirteen awards for outstanding safety performances in the calendar year 1956 were presented recently to the Corps of Engineers and six of its installations.

Six were National Safety Council awards, three of them Awards of Honor, for "All Operations and Activities", "Printing and Publishing" and "General Building Construction."

The other seven were Chief of Engineers awards presented by Maj. Gen. E. C. Itschner to various divisions and specialty offices.

STUMBLING HAZARD ELIMINATED

Spilled materials on a solid walkway caused workmen to stumble and turn ankles. Installation of 80% open Irving Mesh Grating allowed materials to fall through and minimized the hazard.



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For Safe, Strong, Slip-Proof Stair Treads Specify

IRVING "VIZABLEDG" TREADS

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Manufacturers of Riveted, Pressure-Locked, and Welded Gratings of Steel, Aluminum and other metals.

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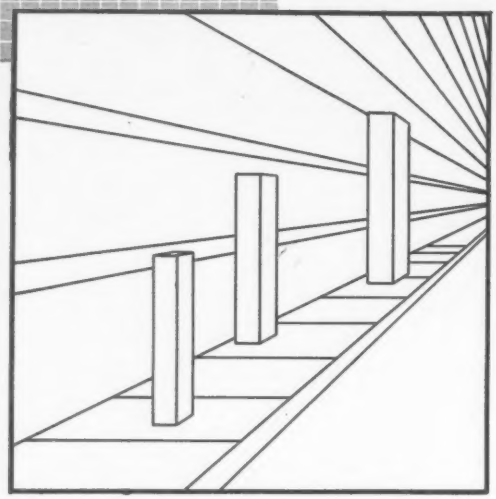
ARKWRIGHT ODDITIES

Test your "perspective powers" by selecting the largest rectangular column in the accompanying figure. See answer below.



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Drawings look sharper, cleaner — and *last longer* — when you use Arkwright Tracing Cloths. Here's why.

1. There are no pin holes, coarse threads or other imperfections to mar your workmanship. Arkwright's flawless finish prevents blobbing and feathering . . . assures fast, accurate inking.

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Obituaries

H. C. Meyer, Jr., Consultant, Was Son of an ENR Founder

Henry Coddington Meyer, Jr., 86, retired president of one the country's largest mechanical engineering firms, and once a staff member and son of one of the founders of ENGINEERING NEWS-RECORD, died at Montclair, N. J., last week.

Mr. Meyer was himself the founder of the New York consulting mechanical and electrical engineering firm of Meyer, Strong & Jones, and with his firm played a great part in the development of the skyscraper type of structure.

The mechanical design for such large major structures as the Empire State Building, the Standard Oil building and Parkchester Houses, were products of his firm.

Mr. Meyer's father, the late Major Henry C. Meyer, who was a holder of the Congressional Medal of Honor for gallantry during the Civil War, was a successful manufacturer of plumbing supplies in New York in 1877, when he founded the magazine "Plumber and Sanitary Engineer", which became "The Engineering Record" in 1890.

Under its earliest and later name, "The Engineering Record" was a strong contemporary of "Engineering News" (founded by George H. Frost in 1874) until the two publications were combined into the present-day ENGINEERING NEWS-RECORD, under the McGraw-Hill banner in 1917. During its early days, "Engineering Record" wrote a great part of the sanitary engineering history of the United States, starting with a prize contest for design of a city tenement house in 1878. That contest, and the designs and discussions which it evoked, was the spark out of which grew New York City's Tenement House Act of 1879, which became a model law for most U.S. cities. Similar journalistic enterprise resulted, in 1881, in the basic rules that were incorporated in New York's plumbing law.

Mr. Meyer, Jr., joined the staff after his graduation with a mechanical engineering degree, from Stevens Institute of Technology, in 1892. He left the publishing field in 1902, to open his own office as a consultant specializing in mechanical and electrical equipment for buildings and power plants. In 1919, the firm became Meyer, Strong & Jones, Inc., with Mr. Meyer as president.

Michael Coffey, 89, former vice president of T. A. Gillespie Construction Co., New York, died June 6.

U.S. 210, BRAINERD, MINN.
NO. 2431
PAY TO THE ORDER OF Highway Users $8,464.00
Eight thousand four hundred sixty-four and 00/100 DOLLARS
Earnings per mile per year U.S. 210

This concrete road earns $8,464 per mile per year

Every road earns money—in gas taxes and license fees paid by drivers using it. The more vehicle miles of travel handled, the more money earned. For example, take U.S. 210, a concrete road near Brainerd, Minn. Here's how its earnings are computed:

Vehicles traveling this road per day	2,700
Times average vehicle tax per mile in Minn.	$.00859
Equals earnings per day per mile	$ 23.19
Times the number of days in a year	365
Equals earnings per mile per year	$ 8,464
Minus cost per mile per year to build and maintain such a road during its lifetime	$ 5,000
Equals net profit per mile per year	$ 3,464

Similar analyses elsewhere show that concrete roads earn the most "profit." That's because they attract the most traffic, have the lowest maintenance cost, the longest service life and the lowest annual cost.

These factors are more significant than ever today, especially on the National System of Interstate and Defense Highways.

With 90% of the cost of these roads being paid by the federal government, states will want the best pavement. That's concrete. Its rugged durability gives it a life expectancy of at least 50 years.

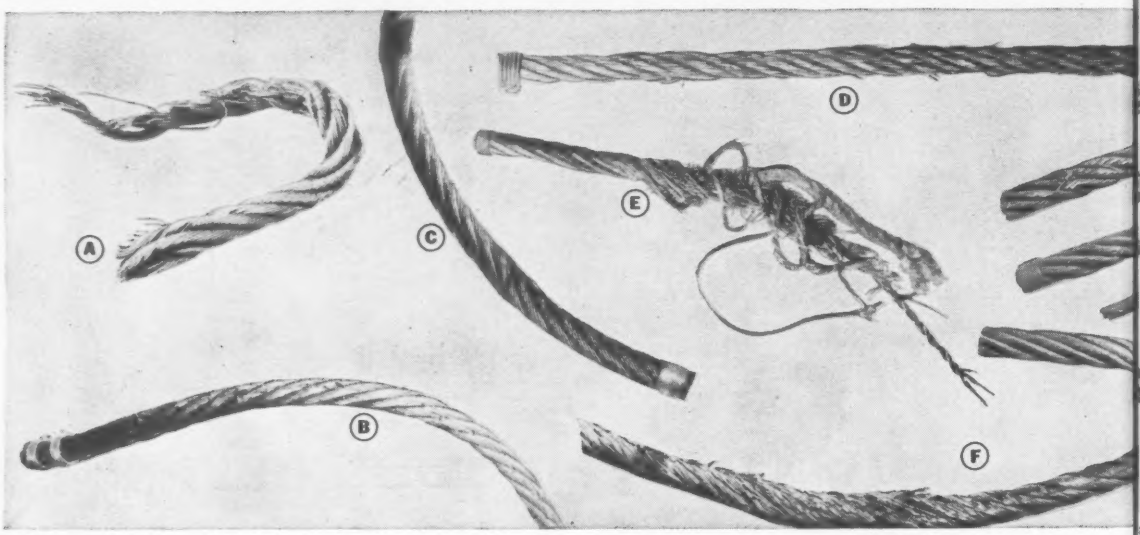
Once built, these roads must be maintained by the state—a good reason for choosing a pavement with a proved record of low maintenance cost. Again, that's concrete. Records from the 24 states keeping such data reveal that concrete costs an average of 26% to 59% less to maintain than other pavements.

Yes, more than ever concrete is the logical choice for all main roads to be built in the biggest road building program ever undertaken in this country.

PORTLAND CEMENT ASSOCIATION 33 West Grand Avenue, Chicago 10, Illinois

A national organization to improve and extend the uses of portland cement and concrete . . . through scientific research and engineering field work

Tuffy Wire Rope Tips



Tuffy gives you a quick run-down here on some of the mortal enemies of wire rope — the abuses that quickly ruin rope efficiency or end its life abruptly long before you have had the service you paid for.

Even the best wire rope is a sitting duck for the enemies which won against the wire rope pictured on these pages. When you avoid or eliminate them you make important gains in longer rope life, better service and greater economy. Remember, your Tuffy distributor will be glad to work with you against these and other wire rope hazards.

It's the "end of the line" for wire rop when these things happen:

A. Mangled in a wedge socket. Here's the result of improp socketing. This fatal rope injury was caused by a poorly d signed or worn out wedge socket. Failure at the dead end c damage other sections of the rope.

B. Rusty road to ruin. Rust — No. 1 enemy of steel — takes heavy toll in wire rope life. It's an insidious, silent type killer, often doing irreparable damage before it's even notice The one-strand break shown above resulted when the rope w allowed to become rust-bound through lack of lubricati With other conditions ideal, tests show properly lubricat rope has up to 10 times the life expectancy of dry rope.

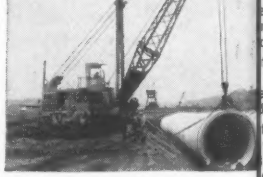
C. The crushing blow. The Sunday punch for this piece of wi rope was delivered by a tractor cleat — just one of many crus ing injuries that result when wire rope is run over or bang into by a hard, sharp object. Even the best rope is no mat for this kind of mistreatment.

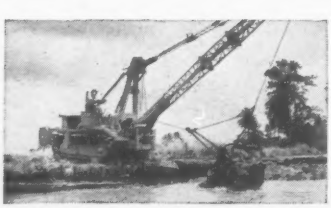
D. Strangled by misfit sheaves. When the bearing surface of

Tuffy Special Wire Ropes are tailored to special use. Ordering is e

Tuffy Scraper Rope

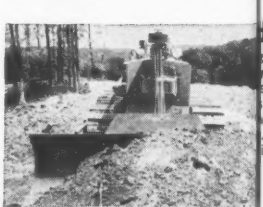
Moves more yardage per foot because **Tuffy** Scraper Rope is specially built to take the beating of extreme drum-crushing abuse. Flexible; withstands sharp bending; hugs sheave grooves and winds snugly and smoothly on drums. High resistance to load shock on slack line.



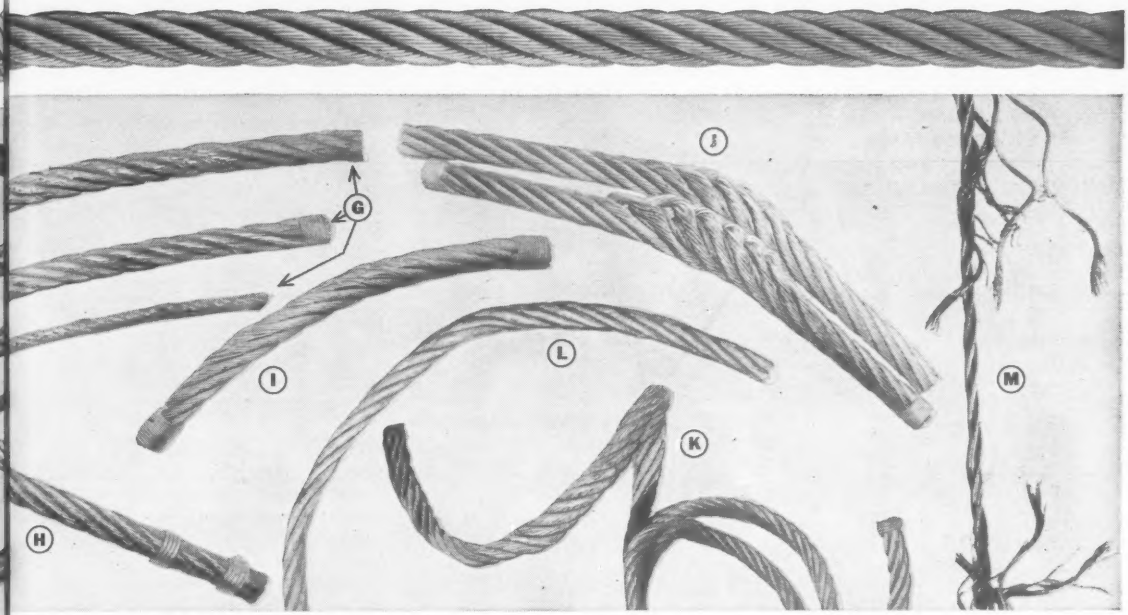


Tuffy Dragline Rope

A longer-wearing line for all dragline operations. Special abrasion resisting construction which also gives extra flexibility. Tuffy Draglines also spool better, ride better on grooves and hold tightly to drums when casting. Consistently dependable in handling any material — wet or dry dirt, sand, gravel, rock, cement or minerals.



ow wire rope is crippled and killed without a fighting chance



ave is too small for the rope diameter, pinching action ckly destroys the rope especially when it is overloaded. The shown above was knocked out in just 1½ hours of service. Apparent suicide! This rope jumped out of sheave and was n destroyed by pulling around the shaft. Actually it was a of sudden slack which threw the rope out of the sheave. This rope came to an untimely end by operating over a ave that did not turn. Note the exceptionally heavy abra- on one side of the rope.

ictim of "the bends." Excessive bending soon wears out e. Generally, more flexible ropes are used as bending sses increase (with decrease in tread diameter of sheave or m). If a rope is operated on a sheave too small for its bend- characteristics, early failure is certain. Through an exhaus- series of bending tests, Union engineers have compiled that you can use to be sure you get the rope construction will give you the longest service life. Ask about it.

On the "blink" from a kink. This open kink resulted from handling of wire rope. Guard against kinks by proper ding on the drum. Never pull a loop smaller; always rge it, then straighten out the rope.

Crushed and worn from "beatings on the drum." Drum wear gives wire rope severe punishment even under normal operating conditions. This wear is found at the cross-over points and at the flange. Excessive drum crushing results from operating on too large or too small a drum. Here are typical "drum beatings":

I. Cross-over wear

J. Cross-over crushing on drum

K. Drum-crushing on over-sized drum

L. Drum-crushing on under-sized drum

Although drum wear cannot be eliminated, its effects can be greatly reduced. Under properly engineered procedures, two and three times the service can be obtained from the same line. Union Wire Rope engineers will help you with this problem. Get in touch with us for more information.

M. Overlouded — soon exploded. Wire rope is "prescribed" for a given use on the basis of breaking strength plus a safety factor of 4. The grade of steel, type of construction and size of the rope determine tensile strength. It must be properly related to the loads it will carry, or expensive and dangerous early failures are likely to occur.

st say **Tuffy** give length and size, and forget complicated specifications.

ffy Slings and Hoist Lines

's a team that cuts hoisting and n time costs in all types of materials dling.

ffy Slings are made of a patented, 9- machine-braided fabric that stays flexible, and isn't materially dam- by knotting or kinking.

ffy Hoist Line is a special construc- with the extra flexibility and tough- for longer service life on overhead es, derricks and clamshells.

ffy Dozer Rope

after ordinary ropes are worn out, Dozer Rope has the stamina it to keep on handling the blade. 150' mounted on your dozers let you cut orn sections without wasting good This unbeatable combination piles izeable savings on dozer rope costs.

Your Tuffy distributor will help check your equipment

Condition of equipment is a big factor in longer rope life and greater economy. Your Tuffy distributor will help you check equipment and operating conditions to make sure everything is in your favor for getting the greatest service out of your Union wire rope. Ask him to lend a hand in a thorough inspection. He'll be glad to do it. And if there are still knotty problems, Union Wire Rope Corporation engineering department will help further.

union Wire Rope **corp.**

2228 Manchester Avenue, Kansas City 26, Mo.

Specialists in high carbon wire, wire rope, braided wire fabric, stress relieved wire and strand

Maker says stronger concrete comes from . . .

High-Speed Turbine-Type Mixer

Developed and marketed in Europe for several years and soon to be available here under a license agreement with its Swedish inventor, for manufacturing and distribution, is a new turbine-type concrete mixer in ½, 1 and 1½ cu yd capacities.

The compact mixer is envisioned as having wide applications in both the industrial and construction fields for low-cost, high-volume production of central-mix concrete for such products as pipe, building block, prestressed units and other items.

With maximum dimensions of 59 in. in height and 8 ft 9in. in diameter, the mixer will fit into concrete plants of limited headroom. It requires no special installation. The ½ cu yd model charges about 30 in. above floor level; the 1 cu yd mixer at about 38 in.; and the 1½ cu yd model about 40 in. from the floor.

Designwise, the mixer has a non-revolving doughnut-shaped mixing drum, with the motor and driving mechanism located in the center of the drum. Mixing is accomplished by a set of 5, 8 or 9 paddles, depending on the mixer size, revolving around the vertical axis.

The drive motor transmits power to the blades through a series of reduction gears, which are enclosed and running in oil. Stresses and shocks are absorbed by these reduction gears which have special bearings to take both radial and axial stresses.

The mixing blades are pivoted in horizontal bearings and operate under spring pressure. They are adjustable for proper clearance against both the bottom and sides of the flat-bottomed mixing drum.

Because of the shape of the mixing drum there is no dead center in the mixing area, a fact which leads the manufacturer to designate its product as a "live mix." The machine is designed for high peripheral speed in the entire mixing area. In addition, the steel blades are positioned so as to give a cross-current mixing action which "braids" the concrete material while traveling at a rate of 9 fbs. It is also claimed that the cement is activated by the whipping action of the blades, resulting in faster and more thorough mixing than by conventional methods.

The entire top of the mixing drum is open, permitting direct charging from any angle. Discharging is accomplished by opening a semicircular door in the bottom of the mixing drum, either by hand or with a compressed-air ram.

CURVED BLADES of mixer are positioned to create "braiding" action.

The three sizes of mixers weigh, 3,100 lb, 6,500 lb and 7,750 lb, respectively. Although basically a stationary-type mixer, a lifting hook is provided to permit handling by crane or monorail hoist. Under such circumstances the mixer becomes its own bucket and can be used to mix while transporting the batch for discharging directly into the forms. It can also be adapted for trailer mounting.

Due to its design features, according to the manufacturer, the mixer makes stronger concrete than conventional machines using the same design mix or it can get the required strength with less cement. T. L. Smith Co., 2835 N. 32 St., Milwaukee 1, Wis.

Faster, Bigger Capacity Mark New Truck Mixers

High-speed cycle, along with improvements in design and operational simplicity, are special features of the new Rex Adjusta-Water Moto-Mixers, now in volume production.

A single-lever operation, with an instrument panel having all controls clustered close before the operator, is a major point.

For the mixing operation, action is achieved by the 12½ deg low-incline drum. This angle, with new drum blading design, results in material tumbling freely within itself, with more free mixing space above the batch for faster, consistent mixing, according to the manufacturer.

To increase discharge speed, there is a one-piece "U" shaped blading arrangement that forms a uniform trough throughout the drum. Lower drum inclination reduces the angle the material has to climb for discharge, further speeding this part of the cycle.

There is a frame fabricated of Z-section members, and there also are offset drum rollers to counteract the tendency for the mixer to lift off the right roller and cause excessive wear.

The water system includes a self-priming centrifugal pump. These models may be equipped with either rear-mounted power or front end power take-off. Chain Belt Co., Milwaukee 1, Wis.

Angledozer Backfills From a Parallel Run

An angledozer attachment for the Davis Loader has been announced. Manufacturers say that with this attachment, the operator can backfill by "shaving in" the dirt while running parallel to the ditch.

The attachment has an angling device as well as three offset adjustments. By pulling two pins, the angledozer attachment can be offset 7 in. to either side of center. The tilt and "bite" of the blade is hydraulically controlled. The blade has a heat-treated cutting edge. With its 28 in. moldboard height and 72 in. width, the dozer attachment is suitable for all ordinary types of ditch back filling. Midwestern Industries, Inc., Wichita, Kan.

Small Size Dump Bodies For City, Builders Use

Three "Speedlift" dump bodies have been designed for contractors and municipalities engaged in handling stone, sand, asphalt mix, and similar materials.

Known as Series 803, 930, and 1030, each is said to offer safety design features — "dirt-free" sloping running boards, tailgate horizontal bracing and bottom structural channel, which prevents the accumulation of dirt, stone, or free material during loading of the body—eliminating hazards in transit.

Capacities range from 3 to 12 cu yd and are in standard body lengths and widths. Features include reinforced heavy-duty understructures, full-height corner posts, a double-acting tailgate and an improved method of adjusting tailgate spreader chains. In the series, 22 models are available. Daybrook Hydraulic Div., L. A. Young Spring & Wire Corp., Bowling Green, Ohio.

OPEN, slide rule measures 10¾ in. Scales spiral for calculations.

CLOSED, slide rule telescopes down to 6 in.; can be slipped into pocket.

Cylindrical Slide Rule Is Introduced in U. S.

The cylindrical slide rule—popular in England and Canada for a number of year—has been introduced in the U. S.

By spiraling the scales around a 1¼ in. tube, the calculator has graduations equivalent to a 66 in. straight slide rule and may be used for all the normal problems.

The instrument can be opened to 10¾ in. length. It telescopes down to 6 in.

All parts of the slide rule are metal and the scales are plastic covered. ARTHUR F. SMITH CO., 311 ALEXANDER ST., ROCHESTER, N. Y.

Improved Wagon Drill Carries Longer Steels

An improved wagon drill, DR-126-A, features long feed travel, a new down-pressure motor and line oiler, and a full range of feed pressures.

The drill is designed for many applications—in quarries, for primary drilling and toe holes; in highway and railroad construction, for blasting rock from right-of-way and making rip-rap and grout holes; in dam construction, for diversion channels, foundations and grout holes. Mounted on barges, it can be used for underwater pier and caisson drilling, according to the manufacturer.

A standard Schramm 4 in. drifter is employed, with 10 ft feed travel for 8 ft steel changes—an improvement over the previous 8 ft travel for 6 ft steels.

Other improvements include a double-cylinder, 7 blade air motor, which runs evenly with 14 impulses per revolution. A new 2 gallon capacity line oiler is arranged so that a motor for the U-bar can be lubricated. At the lower end of the air shell is a centralizer, which prevents the drill from "walking" when a hole is started. SCHRAMM, INC., 900 E. VIRGINIA AVE., WEST CHESTER, PA.

Low Cost Level Designed For Construction Engineers

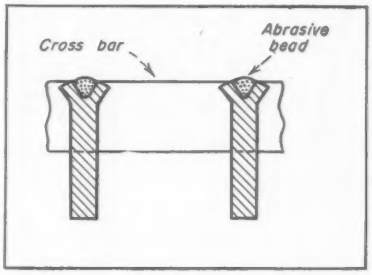
A low cost light dumpy level with 13 in. telescope has been introduced for use on construction jobs. Minimum focus is 6½ ft. Models are available with and without horizontal circle. The one with the circle reads to 5 min. The level vial on both models is 6 in. long and has a sensitivity of 40 sec.

The level weighs 7½ lb, 14½ lb in its box. W. & L. E. GURLEY, TROY, N. Y.

Beads of Abrasive Make Steel Grating Nonskid

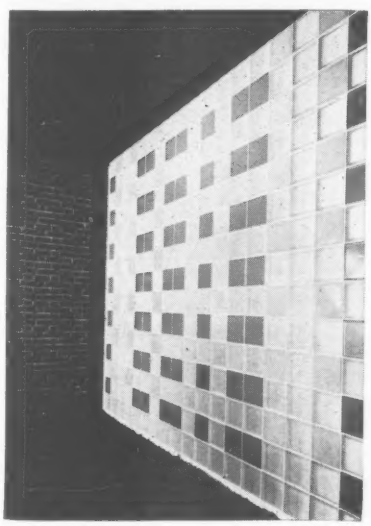
A new steel grating marketed under the name of Relgrit does away altogether with contact between shoes soles and steel. The walking surfaces are continuous beads of abrasive, baked into V-shaped grooves along the tops of the bars.

The manufacturer claims that for leather or neolite shoe soles, Relgrit grating and treads offer a 90% tighter grip (coefficient of friction) than smooth steel grating and 40% better than grids of knurled or serrated bars. Even when covered with oil, it retains some of this superiority of grip, he says.



A further advantage of the product results from grooving the bars. They are split longitudinally to a depth of about ⅛ in. along their upper edges and the incision is spread open to form the V-shaped trough for the abrasive. The sides of the V then become, in effect, flanges of Y-shaped beams, and the loa-bearing capacity of the grating rises about 10%, according to the manufacturer. This helps offset the slightly higher price paid for Relgrit than for plain steel grating.

The material is made with a number of different bar sizes and spacings. It can also be supplied in various metals. RELIANCE STEEL PRODUCTS CO., McKEESPORT, PA.



Colored Finish Developed For Face Of Glass Block

Glass block is now available with colored facings. A fired-on, translucent ceramic finish has been developed to give glass block blue, green, yellow and coral hues, which, the manufacturer claims, give effective decorative designs when block is used in curtain-wall construction.

The colored block is said to have a

THE NEW BARCO VIBRA-TAMP*

* Companion Tool to the Barco Rammer, Famous for Deep, Penetrating Soil Compaction!

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2. Bituminous Surfacing

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. . . New Products

medium light-transmission range of about 25 . In limited production the colored block is available in the 8 in. sq size.

The finish is said to be non-fading, unaffected by acids, alkalis and sulfides and needs little maintenance or washing to retain appearance. PITTSBURGH CORNING CORP., 1 GATEWAY CENTER, PITTSBURGH 22, PA.

. . . Publications

Asphalt additives—A booklet describing a new line of asphalt anti-stripping additives, which can be added at the plant or on the job, and the test by which they were evaluated, is offered by the manufacturer. ARMOUR AND CO., 1355 W. 31ST ST., CHICAGO 9, ILL.

Documentary film—"Test Road, U. S. A.", an 18 minute color-sound film, presents the construction of the test road near Ottawa, Ill. The documentary covers the roadbuilding methods and techniques in grading and sub-grade stabilization. The film, sponsored by Seaman-Andwall Corp., covers details of interest to those concerned with modern highway improvements. Information concerning showings can be obtained from the sponsor. SEAMAN-ANDWELL CORP., MILWAUKEE 1, WIS.

Wire rope—Hazard Wire Rope Division has prepared a 16 page bulletin on its complete line of wire rope, plus information on construction features, applications and diameters to be used. AMERICAN CHAIN AND CABLE CO., INC., WILKES-BARRE, PA.

Carrier and crawler—"Quick Way" offers bulletin on two new crane-shovel models: one, of 4/10 cu yd-8½ ton capacity, with carrier; the other a 5/10 cu yd-7 ton capacity crawler. QUICK WAY TRUCK SHOVEL CO., 2410 EAST 40TH AVE., DENVER, COLO.

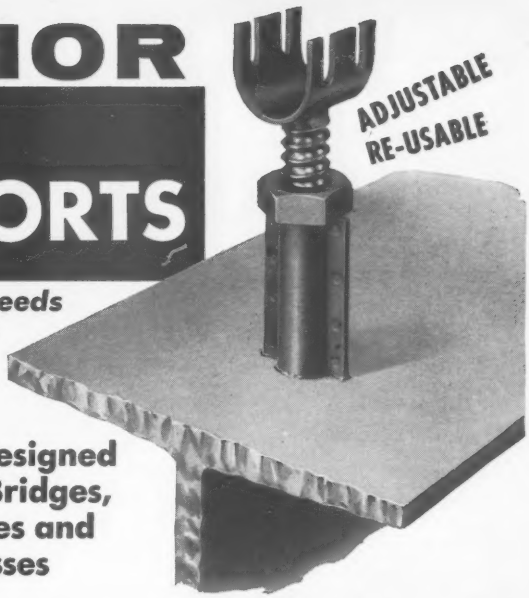
Blade selector—Consolidated Carbide has prepared a masonry and concrete blade selector, giving the efficiency of each blade for any specific job. Both pocket and office size selectors are available. CONSOLIDATED DIAMOND TOOL CORP., 320 YONKERS AVE., YONKERS, N. Y.

Sewer pipe—An 8 page booklet, describing asbestos-cement sewer pipe and couplings, lists sizes and types available. The pipe is said to withstand water pressure of 25 psi, absorb vibration and allow five degrees deflection at each joint. KEASBEY AND MATTISON CO., AMBLER, PA.

New SUPERIOR Heavy-Duty SCREED SUPPORTS

Pat. Applied For

For Use with 1¼" and 1½" I.D. Pipe Screeds and Vibratory Screeding Equipment



ADJUSTABLE SCREED HOLDER

Consists of a 1" threaded rod to which is welded a cradle to hold the pipe screed. This cradle is slotted as shown so that the arms may be bent over to secure the 1¼" or 1½" I.D. pipe screed. Threaded onto the rods is a half nut which provides the adjustment.

Especially Designed for Use on Bridges, Underpasses and Overpasses

These Screed Supports are designed to take the heavy loads imposed by traveling vibrating screeding equipment. The Bases for the screed holders are of two types: (1) The Metal Base for use on structural steel members; (2) the Chair-Type Base for use on a plywood deck.

On Structural Steel: As shown above, the Metal Base is tack-welded to the top flange on approximately four foot centers. The Screed Holder is set into the base, and adjusted to height by turning the nut. The threads are fast, three to the inch, and of a contour type, non-clogging and easily cleaned.

On Wood or Plywood Decks: The Chair Base is set on the deck at approximately four foot centers. It is easily secured to the deck by nailing across the upturned legs. If desired, legs can be supplied of galvanized wire. The Chair Base with holder is shown below.

PERFORMANCE

Superior's Heavy-Duty Adjustable Screed Supports have been used on turnpike structures and other projects. Results in the field indicate that this method of supporting screeds provides a simple answer to an otherwise expensive and complicated set up. *Write for Bulletin.*

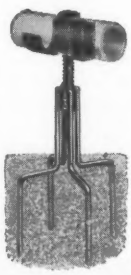
HOLDER INSERTED IN CHAIR BASE

Only the inexpensive bases are left in the concrete. The Adjustable Holders are easily removed, together with the pipe screed, because the holders are set, not screwed into the base. The nut fully covers the base opening and prevents concrete from entering.

Adjustable Standard SUPERIOR SCREED CHAIRS

FOR FORMED SLABS 4½" AND GREATER

With re-usable screed holders using 1" I.D. pipe and rectangular bars for screeds.



FOR SLABS ON FILL

With re-usable screed holders using 1" I.D. pipe and rectangular bars for screeds.

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1775 Broadway, New York 19, N. Y.

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★ Flues and Ducts
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★ Heavy Turbine Housings
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★ Dust Collector Housings
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★ Expansion Joints
★ Hoppers and Bunkers
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★ Wind Tunnels
★ Crane Bridge Girders
★ Trolley Frames and Trucks
★ Rigid Frames
★ Roll-Over Fixtures
★ Tank Turrets
★ Gun Mounts
★ Heavy Truck Bodies
★ Engine Frames and Bases
★ Crawler Frames
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★ Press Columns
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★ Furnace Roof Rings
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★ Complete Machining Service—Facilities for Heavy Work of Unusual Dimensions

STRUCTURAL STEEL
★ For Buildings, Bridges and Special Purpose Structures
Drum Gates
Roller Gates
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Taintor Valves
Protection Angles

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DETROIT 34, MICHIGAN
Branch Offices in New York and Chicago
MAHON

ROUNDED BOTTOM of stilling basin is expected to facilitate gravel removal.

Gravel Trap Removes Threat to Siphon

A unique gravel trap is being constructed by the Platte Valley Public Power and Irrigation District of North Platte, Neb., to catch the abrasive material that now threatens a large inverted concrete siphon.

The siphon, 7,400 ft long and 14 ft in diameter, runs under a railroad and the South Platte River at Paxton, Neb. It is fed from a canal that conducts water from the North Platte River to a series of reservoirs for release for hydroelectric power and irrigation uses.

Before it reaches the siphon, the canal runs past a long hill that contains an 80 ft thick deposit of gravel. Loose stones drop from there into the canal. The gravel is a tertiary deposit of the Ogallala formation, quite abrasive even though individual pebbles tend to be round. Gravel particles up to 2½ in. have been carried to and through the siphon by water flowing at velocities between 5 and 7 fps. Solids have accumulated in the far end of the siphon rate at about 1,000 cu yd a year and have been removed every two years.

Since the siphon was built in 1935, the gravel has abraded away ¾ in. of its 16 in. thick concrete bottom. Loss of ¾ in. of concrete has reduced to 2½ in. the concrete covering #9 reinforcing bars.

Cheapest answer to the danger of exposing the steel was construction of a stilling basin ahead of the siphon.

The basin is 200 ft long. It has a rounded 20 ft wide bottom set 5 ft below the invert of the lined canal that leads into it. Basin sides are on a 1 to 1 slope, making an overall width of 61 ft at ground level.

At the beginning of the basin is a weir 8½ ft above the flow line of the canal. The weir creates a hydraulic jump resulting in reduced water velocity. Canal water is further stilled by five small baffles, each 4 ft high, set at intervals along the bottom of the basin.

J. F. Mesmer, chief hydraulic engineer for Platte Valley PP&ID, said it is expected the basin will reduce the water velocity to 2 to 2½ fps. This should allow the gravel to drop out. The rounded bottom of the basin is expected to facilitate cleaning at periodic intervals with a dragline.

Basic idea for the basin was worked out by Platte Valley, in conjunction with Tippetts, Abbett, McCarthy & Stratton of New York.

Construction is being carried out under a $43,000 contract by Bushman Construction Co. of St. Joseph, Mo. The project was to have been completed in June.

Atomic Sewage Treatment Is Technically Feasible

A process of sterilizing raw sewage by atomic irradiation has been worked out experimentally by the Armour Research Foundation under a contract with the Army Chemical Corps research center at Fort Detrick, Md.

Waste would be the coolant in a nuclear reactor. It would receive about 2,000 times the radiation that is fatal to humans. But the sterilized wastes would not be radioactive enough to constitute a public health menace, according to Army officials.

By using sewage as a coolant, the heat thus available is an additional sterilizing factor. Cost of such a process is estimated at ¼ cent per gal, or $2.50 per 1,000 gal. But, Armour scientists emphasize, all bacteria in the sewage would be killed, not just most of them as in normal sewage treatment processes.

Here at last

FULL 42-INCH PRINTMAKING IN A CONVENIENT Table Model

Now, TABLE MODEL convenience, LOW COST and FULL WIDTH are combined in *one* whiteprinter—the new Ozalid Streamliner 200!

Now, anyone can turn out sparkling whiteprints in seconds—up to 42 inches in width! In the small office, the new Streamliner 200 gives you prints whenever you need them. For the large firm, it handles "rush work"... saves costly interruptions of volume printmaking . . . *stands by* when other machines are "down" for service.

Compact in design, Streamliner 200 stands just 22″ high . . . 38″ deep, with feedboard. Prints stack automatically. Controls are simple, easy to operate. Stand, shown above, is optional.

Why not test-run your own tracings through the Streamliner 200? Call your local Ozalid representative or write: Ozalid, Department M-5, Johnson City, New York.

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Permanently-

Copperweld
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Copperweld* Survey Markers provide permanent, easy-to-locate points of reference that eliminate troublesome disputes. Economical and easy to drive, they can't rot or rust—won't splinter, bend or break. Bronze head can be center-punched and stamped for identification. If larger head is needed, a 4" adapter is available.

*Trade Mark

Furnished in any desired length—in multiples of 6 inches. Packed 10 markers to a carton.

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WIRE AND CABLE DIVISION Glassport, Pa.

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REINFORCED CONCRETE DESIGNS—ALL WORKED OUT!

No more algebraic formulas or calculations to make. Simply locate the table covering the member you are designing, apply span and load requirements, and then *read off directly* concrete dimensions and reinforcing steel data. Follows the latest codes and practices. Send check or money order for your copy, today.

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38 S. Dearborn St., (Div. D) Chicago 3, Illinois

Unit Prices

Missouri Airfield Enlarged

This $747,865 contract calls for 72,850 sq yd of 8 in. and 9 in. concrete pavement on runway and taxiway extensions at the Air National Guard Facilities, Rosecrans Field, St. Joseph, Mo. Work is for the Kansas City District of the Corps of Engineers, Colonel E. C. Adams, district engineer.

Martin K. Eby Construction Co., Inc., Wichita, Kan., took the contract at a price 3% below the second low bids and 5.6% below the estimate.

The runway will be 8,000 ft long and 150 ft wide. Work includes the installation of airfield lighting furnished by the Government.

Specification require that concrete test at a flexual strength of 650 lb psi.

Scheduled wage rates are $1.725 for common labor, $1.88 to $3.15 for semi-skilled labor, $2.325 to $3.325 for equipment operators and $2.50 to $3.50 for skilled labor.

Bidders include:

1C	Martin K. Eby Constr. Co., Inc., Wichita, Kan.	$747,865
2	J. A. Tobin Constr. Co., Kansas city, Kan.	771,185
4	Dwight Haworth, Ottawa, Kan.	885,648
EE	Corps of Engineers, Kansas City District	792,059

Bids: 3-19-57 Items	Unit	Quantity	Unit Prices 1C	2
Clear & grub	ls	job	5,000	$3,000
Site preparation	ls	job	3,500	1,000
Excavation, unclassified	cy	345,000	0.335	0.32
Remove conc pavement	sy	30,650	0.50	0.90
Pvmt, conc, 6"	sy	34,550	3.15	3.25
9"	sy	38,300	3.46	3.50
8", patch	sy	21,200	4.10	4.15
Base course	t	15,300	3.50	2.38
Surfacing, crushed rock	cy	410	5.50	3.20
Portland cement	bbl	34,000	3.80	4.25
Rout & reseal exist pvmt jts w/sealer, type I or IV	lf	108,700	0.14	0.145
type II	lf	91,400	0.07	0.065
Joint repair	lf	1,100	0.40	1.15
Drainage structures, conc	ls	job	750.00	825.00
Flap gate	ls	job	210.00	310.00
Storm drain, CMP arch, 36x22"	lf	400	15.00	9.00
CMP, 30"	lf	84	16.00	9.25
Airfield lighting	ls	job	53,000	65,325
marking	ls	job	4,500	4,315
Fill core drill hole	ea	51	4.50	7.00
Seeding	ac	140	50.00	100.00

Time to complete: 240 calendar days
Liquidated damages: $375 per day

Sanitary Sewers Priced By Depth for Fremont, Indiana

Most of these new sanitary sewers will be in cuts from six to 12 feet, but 3,380 lin ft will be at depths exceeding 12 ft. Prices range from $2 per lin ft for 8" pipe in cut 6 ft and less to $4.75 for 12" pipe in cut over 12 ft. The $133,724 contract to Duncan, Grice & Stairhime of Ft. Wayne was the low bid of 13. Work is for the Town of Fremont, Steuben County, Indiana. Clyde E. Williams & Assoc., So. Bend, Indiana is the consultant.

Concrete pipe C-13 is required for 8" to 12" sewer in depths up to 12 ft. Sizes 10" and 12" in depths over 12 ft take C-200 pipe and the 15" line takes C-14 concrete pipe.

Wage rates range from $3.25 for skilled workers to $2.40 for semi-skilled and $1.75 for unskilled. Both rail and highway transport are available to the site. The contractor furnishes all materials. Class B concrete must test at 2,000 lbs.

Bidders include:

1C	Duncan, Grice & Stairhime, Ft. Wayne, Ind.	$133,724
2	Earth Constr. & Engr. Co., Ft. Wayne, Ind.	138,078
13	Berg Constr. Co., Ft. Wayne, Ind.	238,426
EE	Clyde E. Williams & Assoc. So. Bend, Ind.	168,299

Bids: 6-3-57 Items	Unit	Quantity	Unit Prices 1C	2
Sewers, 8", cut 6' & less	lf	1,160	$2.00	$2.00
6'-9'	lf	10,790	2.30	2.00
9'-12'	lf	5,480	2.75	2.30
10", cut 6' & less	lf	930	2.25	2.30
6'-9'	lf	880	2.50	2.60
9'-12'	lf	5,040	3.00	3.00
over 12'	lf	1,240	4.60	4.00
12", cut 6' & less	lf	2,020	2.75	3.00
6'-9'	lf	1,090	3.00	3.30
9'-12'	lf	1,050	3.50	3.60
over 12'	lf	2,130	4.75	4.50
15", cut 6' & less	lf	1,220	3.85	3.60
6'-9'	lf	350	4.00	4.00
Manholes, std, 6' & less	ea	90	180.00	250.00
addl depth over 6'	lf	280	22.50	25.00
drop pipe connectns	ea	6	39.50	200.00
Lampholes	ea	21	34.00	20.00
Wyes & tees, 12"x6"	ea	35	10.45	6.00
10"x6"	ea	100	8.35	5.00
8"x6"	ea	340	6.25	4.00
Wye stacks, 6" single	ea	7	5.25	20.00
double	ea	13	5.60	20.00
Bldg service connections 6"	lf	3,500	2.00	2.00
Pavement, conc, cut & replaced	lf	280	6.00	7.50
bit, cut & replaced	lf	3,200	2.00	6.25
Excavation, addl earth	cy	50	2.00	2.00
Selected fill	cy	50	3.00	3.00
Concrete, addl, cl B	cy	10	25.00	25.00

Completion schedule: 270 calendar days
Liquidated damages: $50 per day

Twin Girders in Kansas

Continuous steel girders in spans 128'-160'-160'-128' with 30-ft roadways on twin structures 84 ft from center to center will cost the State Highway Commission of Kansas $470,286. Pedestal type piers are 70 ft, 32 ft and 68 ft high. Pile bent abutments are on the east-bound lane, one stub and one pile bent abutment are on the west bound lane. Footings and piles rest on rock, Cl A concrete requires 1.50 bbl of cement per cu yd minimum, Cl AE, lightweight aggregate requires 1.85 bbl minimum.

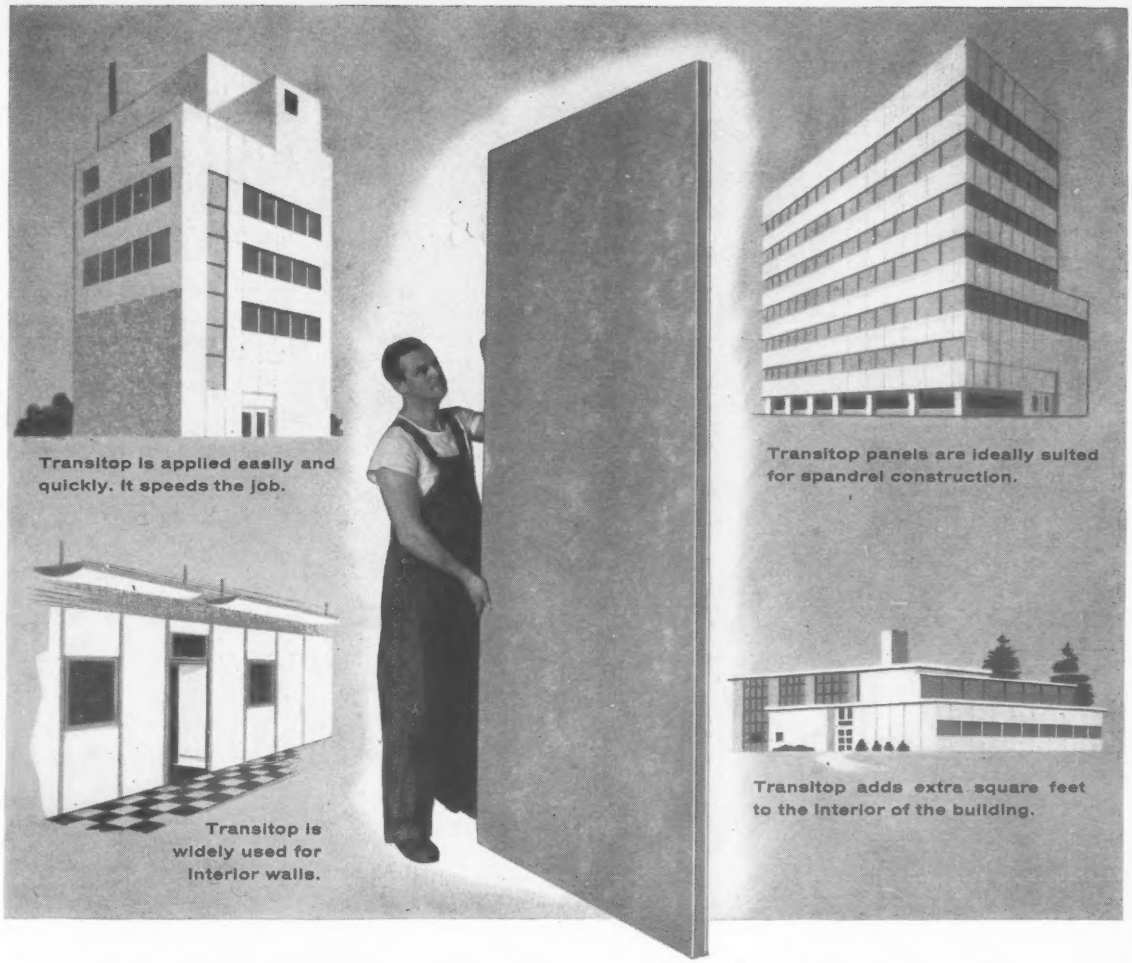
Structural steel workers get $3.10, carpenters $2.10-$2.475, common labor and reinforcing bar workers $1.50.

Bidders include:

1C	Freeto Constr. Co., Inc., Pittsburg, Kans.	$470,286
2	Lint & Clark Constr. Co., Kansas City, Mo.	477,358
9	Union Constr. Co., Kansas City, Kans.	529,527

Bids: 5-9-57 Item		Quantity	Unit Prices 1C	2
Excav, cl I	cy	655	$7.00	$7.00
cl II	cy	795	18.00	17.00
Conc, cl A	cy	1,058.8	48.00	55.00
cl AE, lightweight agg	cy	939.6	58.00	60.00
Steel, reinf	lb	275,410	0.14	0.133
struct	lb	1,361,880	0.198	0.20
Bearing devices	lb	22,332	0.60	0.50
Cast iron	lb	1,088	0.40	0.40
Piles	lf	1,348	5.50	5.00
Handrail, aluminum	lf	2,300	7.20	7.50

Completion schedule: 200 working days
Liquidated damages: $100 per day


Transitop is applied easily and quickly. It speeds the job.
Transitop panels are ideally suited for spandrel construction.
Transitop is widely used for interior walls.
Transitop adds extra square feet to the interior of the building.

8 to 12 feet tall—easy to install

Johns-Manville TRANSITOP® prefabricated panels meet the trend to curtain wall construction in modern buildings

WHEN used as curtain walls, J-M Transitop insulated structural panels often pay their own costs for economy, speed of installation and permanence, in buildings of heavy or light construction.

For instance, a Transitop 1 9/16-inch-thick curtain wall has the equivalent insulation value of a 24-inch thick brick or masonry wall. Because these Transitop panels weigh only 4.7 lbs. per square foot, they reduce the dead load factor. They permit lighter wood or steel framing and make for less expensive foundations.

Comparative cost figures will show clearly that Transitop structural panels can cut dollars from total building costs. You'll note big savings in steel, lumber, labor and time.

Attractive in appearance yet amazingly durable, Transitop panels cannot rust or corrode. They require no painting or other preservative treatment.

J-M Transitop is a prefabricated panel of integrally impregnated insulating board, faced on both sides with noncombustible Asbestos Flexboard sheets. Available in panels 4′ wide by 8′, 9′, 10′ or 12′ long; and 11/16″, 1 1/8″, 1-9/16″ or 2″ thick.

For complete information send for a copy of "J-M Asbestos Transitop." Write: Johns-Manville, Box 111, New York 16, New York. In Canada, write: 565 Lakeshore Road East, Port Credit, Ontario.

THE AMERICAN INSTITUTE OF ARCHITECTS 1857-1957

Johns-Manville congratulates the American Institute of Architects on its 100th Anniversary.

—Consult an architect—use quality materials.

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville

Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES

- Cement, Aggregate, Ready-mixed Concrete, Asphalt: Last, June 6; Next, July 4
- Iron and Steel Products, Pipe: Last, June 13: Next, July 11
- Wood Products, Glass, Explosives, Chemicals: Last, June 20; Next, July 18
- Clay Products, Lime, Plaster, Paint, Roofing: Last, June 27; Next, July 25

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE PARTITION—SCORED Per M. lots of 2,000 pieces or over,			STRUCTURAL CLAY TILE—LOAD BEARING—SCORED Per M. lots of 2,000 pieces or over,			BRICK Per M. In quantity		LIME Per ton, In paper, Carload lot,		
	3x12x12 in.	4x12x12 in.	8x12x12 in.	6x12x12 in.	10x12x12 in.	12x12x12 in.	Common backing	Straight hard	Hydrated finishing	Common hydrated	Pulverized or lump
Atlanta	$149.90p	$149.90p	$299.80p	$334.55p	.....	.....	$30.50p	$32.70p	$23.50	$24.50	$.....
Baltimore	202.00	217.00	406.00	485.50	596.00	681.00	36.00k	41.00k	33.00	22.00	.....
Birmingham	135.00p	152.00p	.....	303.00p	376.00p	465.00p	27.00ff	38.00gg	25.02	22.30	26.33
Boston	217.00†	231.00†	434.00†	520.50†	.....	.....	41.50p	46.50p	39.20†	31.20†	.....
Chicago	135.00	145.00	280.00	.....	.....	.....	30.00	32.00	38.00	35.20e	.....
Cincinnati	205.00j	225.00j	296.00jdd	213.00y	288.00j	314.00j	45.75j	47.00j	30.04j	26.04j	30.04j
Cleveland	209.60	223.00	.....	475.00	.....	.....	43.00	47.00	31.00	26.00	.....
Dallas	152.00	152.00	277.50	337.50	414.75	513.50	25.75	45.00	41.60	25.08	27.65
Denver	.....	.....	.....	.....	.....	.....	36.00	47.50	46.00p	42.00p	46.00p
Detroit	263.00	275.00	506.00	.....	616.00	704.00	44.00p	44.50p	38.00	30.10	.....
Kansas City	158.00	158.00	312.00	312.00	400.00	500.00	33.00	33.00	36.26	34.26	29.76
Los Angeles	r	r	r	r	r	r	32.50§	.....	34.00	34.00	35.00
Minneapolis	188.00p	210.00p	429.00p	210.00pw	.....	.....	43.00*r	52.50ii	46.00bbe	36.00bbe	48.00bbde
Montreal	170.00aq	178.00au	325.00au	270.00	400.00	.....	42.00	49.00	39.00	22.00	15.25u
New Orleans	186.00	186.00	380.00	380.00	.....	.....	40.00	55.00	44.00	32.00	32.00
New York	158.10i	168.60A	231.70cA	233.90kn	.....	.....	44.00	.....	37.00	35.00	.....
Philadelphia	156.30	166.80	312.70	375.20	.....	.....	30/34	34/40	27.60	25.60	3.17m
Pittsburgh	154.00	162.00	292.00	340.00	420.00	496.00	.....	.....	.....	.....	.....
St. Louis	179.00p	203.00p	375.00p	500.00p	459.00	621.50	43.00al	41.50s	0.95eaa	80eaa	1.35ss
San Francisco	156.85*	177.10*	235.30dd*	.....	.....	.....	42.50*	42.50*	27.75	27.75	30.50i
Seattle	225.00p	250.00p	450.00p	250.00pv	.....	.....	43.00	57.00	52.00bb	40.00bb	4.50mbb
Toronto	138.70	148.70	273.75	222.00f	375.00	.....	25.00	63.00	36.00	33.50	31.00

*† F.o.b.yard Roxbury. *a Smooth. *b Per 50 lb. bags. *c 6 x 12 x 12 In.-3 cell. tax extra. exempt. *r Not used because of earthquake danger. *t 5½ x 8 x 11½. *u Tax
*d Pulverized hot. *e 5%, 10th following month. *f 8 x 8 x 12. *g 5½ x 8 x 12. *v Sand lime. *w 5 x 8 x 12. *y Stacked. *z Pebble lime price per 80 lb.
*h F.o.b. trucks, job site N.Y.C. *i 60# sacks. *j Truck load or over. *k $1.00 dis- sack. *aa Price per sack. Lime not sold per ton. *bb LCL. *dd 6 x 12 x 12.
count. *l Red face. *m Per bbl., 180 lb. *n 7⅝ x 7⅝ x 12. Speed tile. *ee Pebble lime. *ff 80% common. *gg Rough. $40.00 Smooth. *ii Chi common.
*o mason's double hydrated pressure. *p Truck lots. *q Provincial and Municipal § F.o.b. yard. *• F.o.b. plant Stockton.

PAINT, ROOFING—F.O.B. CARLOAD LOTS

	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl. Dry a	WHITE LEAD Per 100 lb. in 100 lb. cases In oil w	READY-MIXED PAINT Per gal., drums Graphite b	Aluminum c	Ferric Oxide d	ROOFING SUPPLIES; Carload lots f.o.b. factory Rolls, slate surfaced, 65-90 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 360 lb. bbl. per ton
Atlanta	$19.25	$28.275	$3.59	$3.86	$3.31	$3.39	$2.20	$2.62	$0.67	$57.75
Baltimore	19.00	27.00	2.75	4.25	3.35	2.78	4.25	4.25	.48	50.18
Birmingham	19.25	28.275	3.00	5.40	....	3.37	2.49ii	2.49ii	.87ff	48.00ee
Boston	19.00	27.00	....	....	....	3.63gq	2.83eg	2.83eg	.50g	56.00g
Chicago	19.00	27.00	....	....	....	3.69tu	2.98to	2.98to	46.00bbe	55.70t
Cincinnati	19.00	27.00	....	....	....	2.92	2.50	2.53	.618y	53.96
Cleveland	19.00	27.00	2.3445pqq	2.5133qq	2.8129qq	3.30q	2.54o	2.54o	.454y	47.00gg
Dallas	19.25	28.65	....	3.13B	....	3.00u	3.00o	3.00o	.464	64.00hh
Denver	19.50	28.40	3.20	5.15	5.04	3.11	2.30o	2.45o	.48ff	47.00
Detroit	19.00	27.00	3.25	5.25	5.50	3.30	2.54f	2.409f	.585ff	47.30
Kansas City	19.00	28.55	3.93	3.38	2.99	3.71ii	2.85o	2.85o	.684y	95.70
Los Angeles	19.00	28.15	3.30n	4.50n	4.20n	3.20n	2.15en	l	.70ny	l
Minneapolis	19.00	30.88/28.03	....	....	....	2.99	2.41hi	2.41hi	.442i	48.00r
Montreal	.....	21.96	5.03Dft	5.04Eft	4.65Fft	5.40	4.65f	4.65f	1.60	....
New Orleans	.....	.....	....	....	....	2.74	2.18	2.43	0.680	....
New York	19.00	27.00	....	....	....	3.15	2.43o	2.43o	.444s	48.00*
Philadelphia	19.00	27.00	3.60	3.40/3.65	3.50/4.60	2.75/3.00	2.94	2.94	.45	48.00
Pittsburgh	19.00	27.00	3.10	5.36	5.68	3.72	2.85o	2.85o	.42	58.75
St. Louis	19.00	27.00	....	....	....	3.75iis	2.90hh	2.90hh	.45y	60.00
San Francisco	19.00	28.15	3.20	4.30	3.50	2.69	2.09aa	3.10	.47jj	54.00
Seattle	19.00	28.45	3.47ee	4.19ee	....	3.72qee	3.22hee	....	.50ee	47.20ee
Toronto	.....	.....	....	....	....	4.45	4.10e	4.65o	1.70j	88.00A

*‡ Delivered. *Note: Red lead in oil 50¢ higher than white lead in oil. *a Red lead prices change frequently due to pig lead price changes. *b U. S. War Dept. Spec 3-49A. *c ASTM Spec. D268-31. *d 80% minimum ferric oxide. *e 15 lb. *f Per 432 sq. ft. *g F.o.b.yard, Roxbury. *h Per roll, 65 lb. *i Net carload lot prices: Minneapolis and vicinity. *j 45 gal containers. *k Per cwt. *l Not used. *n F.o.b. city. *o Per 60-lb. roll. *p 6-drum, 50 gal. ea. *q Per 90-lb. roll. *r F.o.b. factory, Chicago. *s Truckload. *t Federal tax included, add 5% mun. & prov. tax. *u Per 90-lb. square. *v Per ton. container. *w Price to contractors $1.25 less. *x Mineral surfaced. *y 55-gallon drums. *z Drums. *aa 15 lb., 324 sq ft roll. *bb Roofers coating and cement; Price per ton. *cc LCL, truck delivery. *ee Asphalt pitch in 100 lb. package. *ff 5-gal. *gg F.o.b. factory. *hh Incl. freight. *ii Per roll. *jj Asbestos roof coating. *A 400 lb barrels. *B ASTM Spec D-962-49. *D Std. Black. *E Ready-mixed. *F Over 80% ferric oxide. *• Aver. wt. approx. 425 to 550 lbs. drums.

PLASTER, VERMICULITE AND METAL BUILDING SHEETS & TUBING

	PLASTER‡		VERMICULITE‡			PERLITE‡		ALUMINUM SHEETht	STAINLESS STEEL† SHEET-TYPE 302g		COPPER WATER* TUBING-TYPE L 2000 ft lots per ft	
	Neat per ton	Gauging per ton	Home Insulation pellets	Plaster aggregate	Concrete Aggregate Untreated	Plaster Aggregate	Concrete Aggregate Untreated	Flat .102" th 36"x96" & 48"x144" per lb/t	Corr roof .032" th 35"x12' per sku	20 ga 48"x96-120" per cwthh	28 ga 36"x120" per cwtmm	⅜"b	½"c
			per bag of 4 cu ft										
Atlanta	$31.00	$36.00	$1.55s	$1.65s	$1.80sl	$1.65	$1.65	$0.424n	$8.96n	$61.44n	$67.50n	$16.74f	$23.41f
Baltimore	22.85	33.25	0.95	1.15	1.15	1.15	1.65	0.431	0.489r	56.25	64.25	0.1674	0.2341
Birmingham	33.00	39.00	1.55	1.55	1.80l	1.55	1.55	0.471	10.02	62.26	70.76	0.2025	0.2464
Boston	22.00	30.00	1.40	1.40	1.45	1.45	1.50	0.444	28.50qp	62.873dd	69.01ddff	0.1674	0.2341
Chicago	26.80	26.80	1.55	1.60	1.60l	1.50	1.50	0.474x	9.805a	62.65aee	71.15aee	0.1674	0.2341
Cincinnati	28.00*	28.00*	1.75	1.75	1.75	1.85	1.90	0.434	9.56	65.03	71.28ff	0.1668	0.2034
Cleveland	28.00	43.00	1.13ii	1.16ii	1.24l	1.45	1.45	0.44aa	8.66	65.08	73.58	16.74f	23.41f
Dallas	30.00	32.00	1.05	1.21	1.37l	1.21	1.32	0.474	0.5075r	64.55	76.30	0.200	0.2810
Denver	25.00	25.00	1.50	1.40	1.50	1.40	1.45	0.444	9.80	65.30gg	73.80gg	0.2006	0.2810
Detroit	25.00	25.00	1.28	1.32	1.41	1.45	1.45	0.455a	9.235a	65.00a	73.50a	16.74f	26.56f
Kansas City	30.00	35.00	1.25	1.45	1.48l	1.40	1.60	0.422	10.95	67.14	75.81	18.99f	26.56f
Los Angeles	26.20	27.20	1.25ii	1.15k	1.25	.95	1.10	0.484	9.96d	64.45	72.95	0.1674	0.2341
Minneapolis	32.00	32.00	1.50	1.60	1.80	1.40	1.40	0.481	....	65.46	78.96ff	0.1674	0.2341
Montreal	27.60	35.60	1.20	1.40	1.50	1.15e	1.15e	0.437	9.92	66.50	.....	0.228	0.287
New Orleans	32.00	45.00	1.25	1.25	1.35	1.25	1.25	0.464	8.303	62.04	70.54	0.1899	0.2656
New York	24.00	30.00	1.35	1.30	1.50	1.30	1.30	0.474ao	9.46ad	65.80	74.30	16.74f	23.41f
Philadelphia	23/25	32.00	1.35	1.35	1.40l	....	....	0.444ae	9.46a	53.23a	60.98a	18.57f	26.09f
Pittsburgh	27.50	31.00	1.30	1.30	1.32	1.35	1.35	0.42	9.19	56.81	82.68	0.2045	0.2572
St. Louis	29.00	40.00	1.35	1.60jj	1.55	1.60	1.65	0.434	9.80	68.11	74.36y	16.74fm	23.41fm
San Francisco	27.85	32.00	1.20	1.20	1.40	1.40	1.40	0.49	9.00	64.95	73.45	0.1674	0.2341
Seattle	41.00	44.00	1.45	1.25k	1.85l	1.50k	....	0.489	9.964	63.00	83.00	0.1674	0.2341
Toronto	28.50	45.50	1.20	1.30	1.45l	....	....	0.4095	24.00ae	73.75	86.50	0.2768pp	0.3347pf

‡ truckiots, delivered † fob warehouse * fob city *a delivered *b ½" O.D. *c ⅝" O.D. *d 0.100"th *e 34" x 60" sheet *f per 100 ft *g 5 tons & up; cold roll, anneal & pickled; 2B finish *h 15M lb lots *j 1100 & 3003 alloy, mill finish *k per bag of 3 cu ft *l treated with air entraining agent *m 2-10M ft *n fob mill, fr allow *o 5M lb & up *p per 100 sq ft *r per lb *s 30# bag *t 36" x 96; 10.81 lb/sh; 48" x 144"; 21.7 lb/sh *u 19.31 lb/sh *v fob plant *w 48" x 144" *x 0.123¢th *y 27 gauge *aa 16M lb & up *dd add $0.75 cwt for boxing *ee 4 tons & up *ff 26 ga *gg add $2/cwt boxing; $0.75/cwt on skids *hh Theoretical wt for 48" x 96"; 60.4-lb. per sh. *ii 300-bag lots *jj per 100-lb bag *mm Theoretical wt: 19.7-lb per sh. *pp Incl 10% sales tax

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BUILDING BOARD & LATH AND INSULATION—DELIVERED TRUCKLOAD LOTS

	GYPSUM PLASTER BOARD tapered edge per Msq ft ½"	½"	GYPSUM BOARD LATH plain or perf per Msq ft ⅜" x 16" x 48"	GYPSUM SHEATHING tongue & groove per Msq ft ½" x 2' x 8'	FIBER BOARD SHEATHING asph impreg & coat per Msq ft ½" sq ed	½" T&G	FIBER BOARD INSULATION sq edge, paint per Msq ft ½"	MINERAL WOOL INSULATION† loose, per 40-lb bag a	3" batts per M sf	GLASS FIBER INSULATION† loose, per 40-lb bag a	3" batts per M sf	ALUMINUM FOIL 60# Kraft Expansible 1 side foil per roll of 250 s. f.	Blanket 2 layers foil per Msq. ft
Atlanta	$70.00	$60.00	$43.50	$70.00	$70.00	$127.00	$70.00	$1.00	$60.00	$2.00[b]	$75.00	.....	.....
Baltimore	51.25[f]	44.75[f]	32.55[f]	55.00[f]	65.00[f]	108.50[f]	69.00[f]	1.30	66.50	1.60	45.00	$4.00[g]	$33.50
Birmingham	73.00	60.00	47.77	75.00	82.00	136.50	81.00	1.40	70.00	1.60	75.00	3.13[g]	.....
Boston	60.00[m]	50.00[m]	36.00[m]	60.00[m]	85.00[m]	120.00[m]	79.00[kn]	1.45	75.00	....	60.00	6.00	55.50
Chicago	67.00	52.00	43.00	62.00	87.00	125.00	87.00	1.35	80.00	....	63/65[bb]	5.25[g]	....
Cincinnati	47.40[w]	42.35[w]	31.55[w]	50.55[x]	70.00[w]	125.00[w]	72.50[w]	1.25	60.00	1.25	73.50	3.12½	50.00
Cleveland	60.50	55.00	40.00	65.00	74.00	130.00	80.00	1.35/1.50	75.00	1.60[aa]	60.75[aa]	17.50[o]	50/55
Dallas	58.00	55.00	42.50	65.00	73.50	122.50	70.00	1.90	65.00	1.35	66.10	4.30[g]	.....
Denver	62.00	54.50	41.00	62.00	75.90	126.00	74.90	....	71.00[j]	1.28[e]	55.00	11.00[r]	21.00
Detroit	59.00	49.50	36.00	61.00	59.50	90.00	59.00	....	.....	1.95[b]	83.00	....	.....
Kansas City	65.00	55.00	40.00	65.00	72.00	115.00	75.00	1.40	75.00	2.00	75.00	4.10[d]	45.00/47.00 [e]
Los Angeles	64.00	50.00	0.325[z]	66.50	71.87	121.25	80.00	....	83.00	1.35[z]	64.00	4.57[g]	.....
Minneapolis	75.00	65.00	0.40[z]	75.00	78.00	140.00	78.00	2.00	80.00	1.80	80.00	5.50	.....
Montreal	56.00	47.40	36/39	53.00	63.25	.....	63.00	1.30	56.00	1.30	56.00	16.20[s]	56.00
New Orleans	57.00	48.00	45.00	60.00	75.00	125.00	72.50	1.75	68.00[aa]	....	.....	.....	.....
New York	53.00	45.50	35.00	54.00	74.50	118.00	73.50	1.55	68.50	1.90[b]	68.50	5.20	52.46[aa]
Philadelphia	50.00	48.00	34.00	48.50	67.50	105.00	55/60	....	63/70	....	70/75	5.60/6.34	34.50/44.50
Pittsburgh	65.00	55.00	40.00	68.00	75.00	105.00	80.00	1.90	72.00	1.90	72.00	4.10	.....
St. Louis	65.00	55.00	39.00	70.00	75.00	120.00	80.00	1.35	55.00	1.65	66.00	5.85[t]	.....
San Francisco	54.00	46.00	0.35[z]	57.00	67.50	108.00	66.50	1.60	66.50	1.60	66.50	4.95	55.00
Seattle	66.00	57.50	49.95	65.00	74.50	125.00	73.50	1.60[y]	74.00	1.60[aa]	50.00[aa]	4.25	46.80
Toronto	61.00	50.00	38.00	64.50	75.00	.....	.....	1.40	60.00	....	60.00	16.00[o]	45.45

[a] for hand packing [b] per 30# bag [c] 2-side foil [d] 40# kraft paper, 5 Msf, 100/500 rolls [e] 20# sq ft bag, 4" thick [f] full trailer loads [g] 80# kraft paper backing [h] LCL [i] 40 lb roll [j] 80 lb roll [k] flame proof $75.00 [m] 10 ton quantities [n] distributor's siding [o] per Msf roll [p] per sf [r] per cwt [s] per 35# bag [t] Insufoil [w] fob city [x] per sq yd [y] 26# bag [z] 32# bag [aa] fob warehouse [bb] 2" [cc] in 250 sf rolls, of 16", 20", or 24" width.

HOURLY WAGE RATES—Base rate + fringe benefits

	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Electrical Workers	Steamfitters	Common Labor Building	Common Labor Heavy Const
Atlanta	$3.35	$2.80	$3.05	$2.80	$3.00	$3.20	$3.30+25[cc]	$1.45	$1.45
Baltimore	3.70+10[cd]	2.95+7½[ef]	3.65+7½[ef]	2.85/3.00+10[cd]	3.00+7½[ef]	3.425	3.30+7½[ef]	1.90+7½[ef]	1.90+7½[ef]
Birmingham	3.50	2.70	3.00+7½[ef]	2.52	2.92	3.175	3.25+10[e]	1.50	1.60
Boston	3.65+15[ei]	3.25+10[cd]	3.55+7½[ef]	3.65+10[cd]	3.65+20[ej]	3.30+13[eB]	3.20+10[cd]	2.30+7[eV]	2.30+7[eV]
Chicago	3.82+7½[ef]	3.45+20[ec]	3.80+15[eC]	3.40+5[em]	3.70+23[ej]	3.65+22[ef]	3.55+22[ecm]	2.77½+7½[ef]	2.77½+7½[ef]
Cincinnati	3.60	3.45	3.50+7½[ef]	3.225/3.475	3.50	3.67+4[eN]	3.65+9½[eZ]	2.50	2.40
Cleveland	3.71½+10[e]	3.74	3.64+10[e]	3.74	3.74	3.765	3.64+10[cd]	3.00	2.915
Dallas	3.70	2.95	3.12½+7½[ef]	3.075	3.50+7½[eK]	3.12½+7½[eK]	3.10+7½[eK]	1.55	1.55
Denver	3.75	3.075	3.10+7½[ef]	2.95	3.37+12½[eh]	3.00	3.35+15[eD]	2.10	2.10
Detroit	3.53+38[ej]	3.25+40[ej]	3.60+22½[ef]	3.20+20[ejmm]	3.58+34[ejo]	3.65+25½[eM]	3.45+14[eB]	2.58+15[ejmm]	2.58+15[ejmm]
Kansas City	3.75	2.95[w]	3.20	3.22	3.50	3.325[j]	3.40+7½[eK]	2.255	2.305
Los Angeles	3.80+10[ehh]	3.25+10[cd]	3.40+10[e]	2.95+10[cd]	3.75+12½[ej]	3.60	3.55+10[cd]	2.30+7½[eK]	2.30+7½[eK]
Minneapolis	3.575[f]	3.15	3.32	3.10	3.25+23[ejmm]	3.25[n]	3.215+20[cd]	2.40	2.40
New Orleans	3.325+5[em]	2.80	3.20+7½[ef]	2.925+5[em]	3.00+5[em]	3.025+7½[eK]	3.15+15[eC]	1.60	1.60
New York	4.25+37[eP]	3.75+30[eJ]	4.15+24.9[eP]	4.00+32[ejj]	4.00+50[eA]	3.65+40[emP]	3.95+35½[eJL]	2.65+21[eV]	2.65+21[eV]
Philadelphia	3.75+17[ej]	3.53	3.80+18[ejM]	3.15½/3.90½+10[cd]	3.65+15[eC]	3.77+15[emn]	4.00+19[ej]	2.25	2.55
Pittsburgh	3.75+17½[emo]	3.40+7½[eh]	3.55+10[emo]	3.35+7½[eh]	3.45+17½[eK]	4.00+7½[emn]	3.425+7½[eK]	2.25+12½[eff]	2.25+10[cd]
St. Louis	3.75+28½[ej]	3.35+10[eh]	3.37+7½[eh]	3.45	3.55+7½[eK]	3.60+26[ej]	3.55+21[eE]	2.40+10[ej]	2.40+10[ej]
San Francisco	3.75+36[edd]	3.25½+20[emo]	3.40+10[ej]	3.205+10[ej]	3.61+20[emo]	3.525+26[eU]	3.45+45[eK]	2.505+10[ej]	2.505+10[ej]
Seattle	3.55+10[cd]	2.94+10[cd]	3.25+10[cd]	3.13+20[cdo]	3.40+10[cd]	3.25+19½[eK]	3.40+23[eT]	2.51+10[cd]	2.51+10[cd]
Montreal	2.20+16[ej]	2.00+16[ej]	2.15+16[ej]	1.90+15[ej]	2.22+17[ej]	2.20+18[ej]	2.22+18[ej]	1.40+10[ej]	1.40+10[ej]
Toronto	2.71+10[emo]	2.50+10[emo]	2.50+10[emo]	2.60+10[emo]	2.60+20[emo]	2.65+11[emo]	2.49+10[emo]	1.55+6[emo]	1.55+6[emo]

ENR Skilled Average (Bricklayers, Carpenters, Ironworkers): $3.515. ENR Common Average $2.294.

*Cost of living bonus now included in basic wage. ** 4% VF. † 8% FB. [a] 6 hr. day. [b] 7 hr. day. [c] 5% vac. stamp fund plus 10¢ WF for bricklayers: 4% VF for electricians plus 8¢ WF, 1% PF. [d] 10¢ H & WF. [e] 10¢ VF. [f] 6% WF. [g] 11½¢ WF 5¢ apprentice, 2½¢ indus fund. [h] $2.85 homes & housing plus 7½¢ WF. [i] 17¢ WF. [j] 10½¢ hr. WF. [k] 7½¢ hr. WF. [l] 4% VF. [m] 5¢ hr. WF. [n] Plus 11% fringe benefits on gross wage ea. yr. [o] 10¢ PF. [p] 3% WF, 3% PF. [q] 10¢ WF; 6% V&H, 3% PF. [r] 4% WF and 20¢ PF. [s] 5% W&PF, 4% VF, 1% NC, 6PH. [t] 7½¢ H&WF. [u] 1½% PF. [v] 10¢ WF. [w] Negotiating. [x] 5¢ VP. [y] 00¢ WF. [z] 5¢ HP. [A] 15¢ WF, 15¢ PF, 20¢ BF. [B] 7½¢VP, 5¢ PF, 1½¢ EF. [C] 15¢ WF. [D] 10¢ H&WH, 5¢ organ. [E] 6% WF, plus travel pay per day. [F] Plus $4 per day Annuity contrib. [G] 3¢ Prom. [H] 10¢ WF, 10¢ VF, 3% PF, 2% PH. [I] 15¢ H&WF, 5¢ for Advtg. [J] 8% WF, 8PH, 3% PF. [K] 25¢ W&PF, 15¢ VF. [L] 3% WF, 3% PF, 2%IVF, 1% EF. [M] 7½¢ PF. [N] 1% WF. [O]10¢ [P] 10¢ health ins.; 7½¢ PF, 5¢ VF. [Q] 1 drum, 2 drums 3.40/3.55 + 10¢. [R] 10¢ H&WF, 2¢ admin. and 1¢ apprentice. [S] 12½¢ H&WF. [T] 23¢ H, W&VF. [U] 10¢ WF, 4% VF, 1% PF. [V] 5% WF, 3% PF. [W] 2% F. [X]12¢ VF, & 7½¢ H&WF. [Y] 7¢ H&WF. [Z] 9½¢ WF. [aa] 7¢ WF, 15¢ PF. [bb] 8¢ WF, 2¢ advg. [cc] 25¢ H&WF. [dd] 12½¢ WF, 14¢ PF, 5¢ Jt Bd 5¢ Prom. [ee] 0 FB. [ff] 7½¢ ins. [gg] 10¢ ins. [hh] 7½¢ H&WF, 5¢ indus. prom. [ii] 4% PF, 4% PF, 6PH. [jj] correction.

	Truck drivers 1½ T	Truck drivers —4 cy	Truck drivers +4 cy	Tractor Operators Incl. bulldozers 34-49 hp	Tractor Operators Incl. bulldozers 70-100 hp	Tractor Operators Incl. bulldozers 100 & over	Tractor scraper 15-16 cy	Power cranes & shovels ½ cy	Power cranes & shovels ¾ cy	Motor grader oper	Air comp oper	Air tool oper
Atlanta	$1.75	$.....	$.....	$2.525	$2.525	$2.525	$2.525	$3.05	$3.05	$2.525	$2.30	$1.67
Baltimore	1.60+7½[ku]	1.75+7½[ku]	1.85+7½[ku]	3.15/3.30[b]	3.15/3.30[b]	3.15/3.30[b]	3.15/3.30[b]	3.55/3.70+10[km]	3.55/3.70+10[km]	3.15/3.30[b]	2.85/3.30[b]	2.40
Birmingham	1.60	1.79[ff]	2.05[ro]	2.66	2.66	2.66	2.80	2.80	2.80	2.76	2.385	1.75
Boston	2.195[c]	.....	.....	3.275+10[kdm]	3.275+10[kdm]	3.275+10[kdm]	3.275+10[kdm]	3.65+10[km]	3.65+10[km]	3.275+10[km]	3.20+10[km]	2.60+7[ke]
Chicago	2.16+12[kfrp]	.....	.....	3.00+5[ko]	3.15+5[ko]	3.20+5[ko]	3.00+5[ko]	3.75+5[ko]	3.75+5[ko]	3.25+5[ko]	3.10+5[ko]	.....
Cincinnati	2.20[oo]	2.30[oo]	2.40[oo]	3.225	3.225	3.225	3.225	3.475	3.475	3.475	3.475	3.475
Cleveland	2.625+10[km]	2.625+10[km]	2.625+10[km]	3.49	3.49	3.49	3.49	3.74	3.74	3.49	3.365	3.365
Dallas	1.55	1.55	1.55	1.55/2.625[f]	1.55/2.625[f]	1.55/2.625[f]	1.55/2.625[f]	1.55/2.625[f]	1.55/2.625[f]	1.55/2.625[f]	1.55/2.00[f]	1.70/2.00[f]
Denver	2.20	2.30	2.45	2.20	2.80	2.80	2.80	2.95	2.95	2.80	2.80	2.40
Detroit	2.45	2.45	2.45	3.50+10[kmff]	3.50+10[kmff]	3.50+10[kmff]	3.50+10[kmff]	3.50+10[kmff]	3.50+10[kmff]	3.50+10[kmff]	3.225+10[km]	2.71+25[kmm]
Kansas City	2.23[n]	2.23[o]	2.305[p]	2.425	2.925[q]	2.975[q]	2.975[r]	3.22	3.22	2.835	2.975[r]	2.35
Los Angeles	2.405+7½[ku]	2.405+7½[ku]	2.435+7½[ku]	3.025+10[km]	3.05+10[km]	3.05+10[km]	3.30+10[km]	3.30+10[km]	3.30+10[km]	3.30+10[km]	2.54+10[km]	2.51+7½[ku]
Minneapolis	2.40	2.40[w]	2.55[x]	2.78	3.00[w]	3.07[x]	3.00	3.22[w]	3.48[x]	2.78	2.67	2.38
New Orleans	1.75	2.00	2.00	2.275+7½[ku]	2.925+7½[ku]	2.925+7½[ku]	2.925+7½[ku]	2.925+7½[ku]	2.925+7½[ku]	2.925+7½[ku]	2.275+7½[ku]	1.70
New York	2.21[hh]	2.75+14[khh]	2.75+14[khh]	3.37½+27[eh]	3.37½+27[eh]	3.37½+27[eh]	3.50+28[eh]	4.25+34[eh]	4.25+34[eh]	3.50+28[eh]	3.50+28[eh]	3.10+15[eoo]
Philadelphia	—1.925/2.15+7½[ku]—			—3.15½/3.90½+10[km]—			3.15½+3.90½ +10[km]	— 3.15½+3.90½+10[km] —		3.15½+3.90½ +10[km]	2.97½+10[km]	2.13½+10[km]
Pittsburgh	2.20+7½[ku]	2.20+7½[ku]	2.20+7½[ku]	2.87½+7½[ku]	3.20+7½[ku]	3.27½+7½[ku]	3.25+7½[ku]	3.35+7½[ku]	3.35+7½[ku]	3.25+7½[ku]	3.35+7½[ku]	2.20+7½[ku]
St. Louis	2.50+7½[kmm]	.....	.....	3.45[kk]	3.45[kk]	3.45[kk]	3.45[kk]	3.45[kk]	3.45[kk]	3.45[kk]	2.90[kk]	2.90[kk]
San Francisco	2.55+10[ke]	2.55+10[ke]	2.69+10[ke]	3.32+10[ke]	3.32+10[ke]	3.32+10[ke]	3.32+10[ke]	3.65+10[ke]	3.65+10[ke]	3.48+10[ke]	2.93+10[ke]	2.65+10[ke]
Seattle	2.80+7½[kmu]	2.80+7½[kmu]	3.00+7½[kmu]	3.10+20[ell]	3.10+20[ell]	3.10+20[ell]	3.10+20[ell]	3.46+20[ell]	3.46+20[ell]	3.19+20[ell]	2.85+20[ell]	2.71+10[em]
Montreal	1.40+11[ell]	1.40+11[ell]	1.40+11[ell]	1.60+15[ell]	1.83+15[ell]	1.83+15[ell]	1.83+15[ell]	2.09+16[ell]	2.09+16[ell]	1.83+15[ell]	1.70+15[ell]	1.70+15[ell]
Toronto	1.60+6[ell]	1.60+6[ell]	1.60+6[ell]	2.00+10[ell]	2.10+10[ell]	2.10+10[ell]	2.10+10[ell]	2.60+16[ell]	2.60+16[ell]	.....	2.15+8[ell]	2.15+8[ell]

[a] 5¢/hr. H&WF. [b] lower rates, straight time, other broken. [c] 2-axle; 10 wheel $2.25; Euclid $2.45. [d] intermediate. [e] bldg contr; highway $2.45+7¢ WF. [f] less than 2-T. [g] up 6 cy. [h] 4% WF, 4% PF. [i] 6-8 cy. [j] plus $2 pd by employer for hosp. death benefits to family. [k] bldg constr; steel contr $3.475. [l] higher rates are union, other taken from min. wage approved by County Commissioners Court. [m] 10¢ H&WF. [n] flatbed. [o] under 10 cy. [p] over 10 cy. [q] over 50 hp. [r] blade grader. [s] 10¢ WF. [t] 7½¢ H&WF. [u] cat oper. [v] up to 3½ cy. [w] 3½ cy & over. [x] 3½ cy & over. [aa] plus W&PF. [bb] 3% WF, 2% PF, 11 PH. [cc] up to 5 cy. [dd] up to 5 cy. [ee] 5 cy & over. [ff] over 11½ T but not over 3. [gg] up to 5 tons. [hh] excavating. [ii] 4% VF. [kk] 7½¢ WF included in base pay. [ll] 8% fringe benefits. [mm] 10¢ H&WF, 10¢ ins., 5¢ VP. [nn] 6 cy or less; 8-16 by $2.90; 16-25 cy $3.15. [oo] Plus $2.25/wk WF. [rr] 12¢ WF. [ss] 5% WF, 6 PH. [tt] 10¢ H&WF, 10¢ PF. [jj] correction.

MEXICO CITY PRICES

In Pesos, F.o.b. City		May '57	June '57
Common Wages—Building (8 hr. day) (Peons)	av. per hr.	1.38	1.38
Common Wages—Heavy Const. (8 hr. day) (Peons)	av. per hr.	1.38	1.38
Skilled Labor Wages			
Carpenters (8 hr. day) 1 cl.	av. per hr.	2.48	2.48
Bricklayers (8 hr. day) 1 cl.	av. per hr.	2.48	2.48
Struct. Iron Workers (8 hr. day) Remachadores.	av. per hr.	3.77	3.77

Struct. Steel, Shapet		May '57	June '57
3"-15" x 12 meters per metric ton		2100.00#	2100.00#
# fob Monterrey			
Reinf. Steel, Corr. Rods			
¼" x 11 meters	per ton	2000.00	2000.00
⅜" x 11 meters	per ton	2000.00	2000.00
½" x 11 meters	per ton	2000.00	2000.00
⅝" x 11 meters	per ton	2000.00	2000.00
¾" x 11 meters	per ton	2000.00	2000.00

Gravel truck load at 3½ cu. meters		May '57	June '57
Blue Gravel	per tr. load	75.00	75.00
Rose Gravel	per tr. load	73.00	73.00
Cement, Std. Port. (Tolteca)	per tan	240.00	240.00
Lumber			
1" Pine	per M ft.	1400.00	1400.00
1½" Pine	per M ft.	1650.00	1650.00

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, D. TARTAGLIA, S. N. NOLAN, Reports
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—LB & CA

▲† **Hartwell Co. Inc.,** 33 Sutton Ave., Providence, R. I., CA $655,719, high temperature WATER DISTRIBUTION SYS., Otis Air Force Base, ENG-19-016-57-212, FALMOUTH, MASS., U. S. Eng., 150 Causeway St., Boston, Mass. J. O. Ross Engineering Corp., 444 Madison Ave., N. Y. C., engr. Bids May 27. CD 5/31/ under LB.

† **Dist. P. Wks.** Office First Naval Dist., 495 Summer St., Boston, Mass., cancelled bids to have been opened Apr. 26, hydraulic ACCESSORIES at Naval Air Station, NBy 10 Spec No. 10/56, QUONSET POINT, R. I. est. $2,279,000. CD 3/27.

† **New England Dredge & Dock Co.,** 60 S. Water St., New Haven, Conn., CA $731,640. Item No. 1 and 2, maintenance dredging West River, New Haven, CIVENG 19-016-57-71, CONNECTICUT. U. S. Eng., 150 Causeway St., Boston, Mass. CD 3/6.

CONNECTICUT—State Hy Dpt., 165 Capitol Ave., Hartford, Bids opened 6/10,

Conn.—**Webster & Webster, Inc.,** 1366 Main St., East Hartford, Conn., LB $630,780, railing and fencing on Conn. Turnpike. Proj. 310-07, Cities of Fairfield, Bridgeport, Stratford and Milford; Fairfield and New Haven Counties.

Conn.—**Velleca Constr. Corp.,** 175 Grand Ave., New Haven, Conn., LB $168,218, c.conc. 2,450 lin. ft. on parking areas of Wilbur Cross Parkway, City of Woodbridge. CD 6/3.

Conn.—no bids received 6/10—dredging channel of Housatonic River in vicinity of Washington Bridge, Rte US 1, Proj. 138-88, Milford and Stratford. CD 6/3.

D'Addario Constr. Co., 513 Boston Ave., Bridgeport, Conn., LB $660,065 (6 bidders) 9 ft. precast rein.-con. pipe enclosing Cemetery Brook in 9 ft. conduit, between New Britain Ave. and Cedar Hill Cemetery for Cemetery Brook Flood Control Proj., HARTFORD, CONN. Park River Flood Control Conn., 11 Asylum St., Hartford, Conn. Bids June 11. CD 5/10.

BUILDINGS—LB & CA

Central Maine Youth Center Inc., Bartlett St., Lewiston, Me., Separate Contracts, Approx. $800,000, rebuild youth center, LEWISTON, ME., CD 3/25.

▲ **George A. Fuller Co.,** 597 Madison Ave., New York, N. Y., CA $3,000,000, 100,000 sq. ft., air cond., brick masonry OFFICE BLDG., High St., Boston Branch, BOSTON, MASS., Travelers Insurance Co., 700 Main St., Hartford, Conn., Kahn & Jacobs, 2 Park St., New York, N. Y., archts. Awarded June 10.

Morris & Son, Constr. Co., 219 Central St., Lowell, Mass., CA $602,000, 5 sites, housing of the Elderly, State Aided Proj. 667-1, LOWELL, MASS., City, Housing Authority, 18 Market St., Lowell, Mass., Bids May 8, CD 5/15 under LB.

▲ **E. Turgeon Constr. Co., Inc.,** 42 Weybosset St., Providence, R. I., CA $2,602,321; George Bldg. for cancer treatment and research. Lockwood St., PROVIDENCE, R. I. Rhode Island Hospital, 593 Eddy St., Providence, R. I., bids May 2, CD 6/11 under LB.

▲ **Austin Co.,** 19 Rector St., New York, N. Y., CA approx. $1,000,000. 150,000 sq. ft. FACTORY, Sugar Hollow Rd., DANBURY, CONN. Barden Corp., E. Franklin St., Danbury, Conn. Sherwood, Mills & Smith, 65 Broad St., Stamford, archts. Awarded June 13. CD 8/22/56.

John Woods, Brainard Rd., Thompsonville, Conn., Owner Builds, $345,000. 32 HOUSES, Roosevelt Rd.; $345,000. 32 houses, Alban Rd.; $550,000. 27 houses, Taber Rd., 28 houses, Till St.; $345,000. 3 houses, Booth St., 17 houses, Pomeroy Rd., 7 houses, Teresa Rd., 5 houses, Phyllis St. $420,000. 26 houses, Corney Rd., 16 houses, Nevins Ave., ENFIELD, CONN.

▲ **Southern New England Contracting Co.,** 66 Sanford St., Hartford, Conn., CA $1,396,000. junior high SCHOOL, NEWINGTON, CONN. Town, School Bldg. Comm., Town Hall, Newington, Conn. Bids June 4. CD 6/7, under LB.

U. S. Plywood Corp., 55 W. 44 St., New York, N. Y., cancelled bids to have been opened May 14, 130x 160 ft. WAREHOUSE and 50x60 ft. office, Ardmore St., FAIRFIELD, CONN., Est. $216,000. CD 5/16.

I. R. Stich Assocs. Inc., 611 New Park Ave., West Hartford, Conn., Owner Builds, $494,670, 33 HOUSES, Second section of Hilltop Estates, Griffin Rd., SOUTH WINDSOR, CONN.

Leeds & Goebel Inc., 567 Summer St., Stamford, Conn., Owner Builds, $954,000. 32 HOUSES, and roads, Hope St., SPRINGDALE, CONN.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—LB & CA

▲ **NEW JERSEY**—Comr, State Hy. Dpt., 1035 Parkway Ave., Trenton, Bids opened 6/11,

N. J.—**Ole Hansen & Sons,** Franklin Ave., Pleasantville, N. J., LB $1,833,717 (6 bidders), grading 2.126 mi., bridges and incid. paving Rte. 60 Freeway, Section 2A, from Station 40 plus 00 to Station 157 plus 75, Camden Co.

N. J.—**Ulfheil Construction Co.,** 278 River Rd., New Milford, N. J., LB $193,723 (5 bidders) constr. 1.18 mi. Schraalenburgh Rd. from Durie to Harrington Aves., FA Sec. Proj. No. S-209 (1), Bergen Co. CD 5/29.

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton,

Franklin Contracting Co., 12 Central Ave., Newark, LB $5,092,636 (8 bidders), grading, paving, bridges and walls 1.438. mi. Route 21 Freeway, Sec. 1A from Williams St. to Roosevelt Ave., Essex County, Belleville, Fed. Proj. U-126 (9). CD 5/23.

P. Michelotti & Sons Inc., 150 Midland Ave., Saddle Brook, N. J., CA $867,805, impvt. Forest Ave. 4-mi. road through Paramus from Rte. 4 to Westwood, PARAMUS, N. J., Bd. Freeholders, Admin Bldg., Hackensack, N. J., CD 6/6.

Princemont Constr. Corp., 322 N. Stonestreet St., Rockville, Md., LB $587,910; paving, repaving and widening roadway of Bladensburg Rd., N. E. between 24th Place and Eastern Ave. (Fed. aid Proj. F-65 (2) WASH. D. C., D. C. Govt. Dpt. Hys., 499 Pa. Ave. N. W., Wash., D. C., Bids June 7. CD 6/4.

BUILDINGS—LB & CA

J. A. La Rocca, 63 Zabriski St., Jersey City, N. J., CA $750,682, 63-unit low rent HOUSING project on Lincoln Place and W. Lake Ave., ASBURY, N. J., City of Asbury Park Housing Auth., Washington Place, Asbury Park, N. J. Bids May 14, awarded June 10. CD 5/23.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England | **Middle West**
Middle Atlantic | **West of Mississippi**
South | **Far West**

PROPOSED WORK

Water Supply | **Public Buildings**
Sewers, Waste Disposal | **Mass Housing**
Bridges | **Commercial Buildings**
Streets & Roads | **Industrial Buildings**
Earthwork, Waterways | **Unclassified**

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily
For additional reports see Construction Daily.

DeRoe Builders Inc., U. S. Hy. 46 Clifton, N. J., Own forces, $900,000, 30 HOUSES on Ridge Road, CEDAR GROVE, N. J.

▲ **Elton Realty Corp.,** 10 Lakeview Dr., Trenton, N. J., Own forces, $1,000,000. 50 HOMES on Coleridge Ave. known as Sunnybrae, section of Yardville, HAMILTON TWP., N. J., A. H. Salkowitz, 87-25 Homelawn St., Jamaica 32, N. Y., archt.

William Barretts, Livingston Ave., Livingston, N. J., Own forces, $700,000, 31 HOUSES on South Livingston Ave. known as Wahconah Park, LIVINGSTON, N. J., George Overath, 39 Collingswood Ave., Livingston, N. J., archt.

▲ **Bel Art Estates Inc.,** Coddington Rd., New Providence, N. J., Own forces, $1,300,000, 60 HOUSES on Magnolia Drive known as Salt Brook Estates, NEW PROVIDENCE, N. J., Peter Grygotis, 306 Aldene Rd., Roselle, N. J., archt.

John Ryan Constr. Co., 11 West 42nd St., New York, N. Y., CA $750,000, steel, brick and stone L-shaped BUILDING, 1 portion of L 6 x 120; other 110 x 160, SUMMIT, N. J., Archdiocese of Newark, Oratory School, Bedford Rd. and Morris Ave., Summit, N. J., Eggers & Higgins, 100 E. 42nd St., Summit, N. J., archts.

▲ **Arthur Venneri,** 300 Northern Ave., Westfield, N. J., CA $1,009,800, Thomas Alva Edison Jr. High SCHOOL, WESTFIELD, N. J., Bd. Educ., Westfield, N. J., Frederick Elsasser, 2013 Morris Ave., Union, N. J., archt., CD 5/22.

Arthur G. McKee Co., 2300 Chester St., Cleveland, O., CA $620,000 BLAST FURNACE No. 2 addns., alterations, CONSHOHOCKEN, PA. Alan Wood Steel Co., Conshohocken, Pa. CD 12/5/55.

Fort Washington Industrial Park Constr. Co., Fort Washington, Pa., CA $500,000. LABORATORY, warehouse distribution center and office, FORT WASHINGTON, PA. American Cyanamid, 30 Rockefeller Plaza, New York, N. Y. CD 10/4/56.

Wark & Co., 1920 Sansom St., Phila., Pa., CA $511,000, general contract, elementary SCHOOL, Highland Farms, HAVERTOWN, PA. Haverford Twp. School Dist., Havertown, Pa. Bids May 7. CD 5/17, under LB.

Townsend & Elfreth Co., 1601 Chestnut St., Phila., Pa., CA $750,000. 3 story, masonry structural steel, steel PLANT ADDN., JENKINSTOWN, PA. Standard Pressed Steel Co., Jenkinstown, Pa. Widdicombe Eng. Co., 117 S. 17 St., Phila., engr. CD 6/4.

Brown & Matthews Inc., 404 4 Ave., New York, N. Y., CA $500,000. 1 story, 25,000 sq. ft., brick, steel printing PLANT, PAOLI, PA. Deleco Corp. of Penna., Berwyn, Pa.

Arthur A. Kober Co., 9 Union Ave., Bala Cynwyd, Pa., CA $500,000. 3 story, 25,000 sq. ft., brick, block, structural steel OFFICE and parking area, PHILA., PA. United Insurance Co., of America, 1313 S. Michigan Ave., Chicago, Ill. CD 1/29, under CA.

▲ **Stoffler & Tillotson,** 2043 Eastburn Ave., Phila., Pa., LB $2,472,000. PATIENT'S Bldg. and occupational therapy bldg. PHILA., PA. Pennsylvania Hospital, 111 N. 49 St., Phila., Pa. Bids May 28. CD 5/6.

▲ **Joseph D. Scott Co. Inc.,** 1231 Elbridge St., Phila., Pa., Separate contracts, $1,600,000. 100-unit RESIDENTIAL DEVELOPMENT, Moyer Rd., etc. POTTSTOWN, PA.

Somers Constr. Co. Anc., Union Ave. and Cynwyd Rd., Bala Cynwyd, Pa., CA $550,000. 3 story, 44x137 ft. brick, granite, limestone trim, HOSPITAL, RIDLEY PARK, PA. Taylor Hospital, Ridley Park, Pa. Bids May 29. CD 5/24.

SOUTH

HEAVY CONSTRUCTION—LB & CA

▲ **VIRGINIA**—Bureau P. Rds., Dpt. Commerce, 1440 Columbia Pike, Arlington, bids opened 6/12

Va.—**Wright Contr. Co.,** Odenton, Md., LB $1,137,360; (7 bidders) viaducts 0.167 mi. over Glebe Rd. and Pimmit Run (abutment, piers and superstructure) Proj. 1A9, 1A10, George Washington Memorial Parkway, Arlington and Fairfax Counties, CD 5/17.

NORTH CAROLINA—State Hy. & P. Wks., Raleigh, Jesse M. Coble, Box 664, Greensboro, N. C., CA $688,687, structures 12.7 mi. Proj. 4950, Vance and Warren Counties. Bids Apr. 23. CD 4/15, under Streets and Roads.

▲† **Ruscon Constr. Co.,** 149 E. Bay St., Charleston, S. C. CA $1,769,342; Calss MAINTENANCE HANGAR, Marine Corps Auxiliary Air Station, NBy 4977; BEAUFORT, S. C. Dist. P. Works Officer, Dpt. Navy, Naval Base, Charleston, S. C. CD 6/11, under LB.

▲† **Batson-Cook Co.,** Box 151, West Point, Ga. LB $3,549,433, relocation of Naval Air Station at Atlanta to Dobbins Air Force Base, Marietta, GEORGIA. Sixth Naval Dist., Bldg. 13, U. S. Naval Base, Charleston, S. C. Bids June 12.

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Kaminer Constr. Co., Box 227, Chamblee, Ga., CA **$528,419.** Div. I, raw water pumping station and water treatment plant addns. MARIETTA, GA. Cobb County-Marietta Water Auth., Court House, Marietta, Ga. Bids May 27, awarded June 6. CD 6/5, under LB.

† **J. A. Jones Constr. Co.**, 133 Ellis St., N. E., Atlanta, Ga. CA **$727,881**; site work and outside utility sys. for guided missile school, ENG 01-076-57-87; Redstone Arsenal, HUNTSVILLE, ALA. U. S. Engrs., 2301 Grant St., Mobile, Ala. Bids May 29. CD 6/10, under LB.

Louisiana State Bldg., Auth., State Capital, Baton Rouge, La., rejected bids May 28, stadium for Grambling College, GRAMBLING, LA., LB **$546,326.** CD 6/10.

L. O. Throckmorton, La Marque, Tex., LB **$538,745**, (3 bidders), masonry airmen's dining hall bldg., Lake Charles Air Force Base, INV. NO. 57-49, LAKE CHARLES, LA., U. S. Eng., Box 1229, Galveston, Tex., Bids June 6, CD 6/11.

BUILDINGS—LB & CA

▲ **J. M. Thompson Co.**, 655 W. Lenoir St., Raleigh, N. C., CA **$1,517,000.** West Campus DORMITORY, RALEIGH, N. C. N. C. State College, Raleigh, N. C. Bids May 17. CD 6/10, under LB.

Robert L. Turchin, Inc., 1835 Purdy Ave., Miami Beach, Fla., CA **$600,000**; 4 story, basement, 180x226 ft. rein.-con., steel frame, HOTEL, 4747 Collins Ave., MIAMI BEACH, FLA. Ralph & Jean Lachman, 4454 Adams Ave., Miami Beach, Fla. Melvin Grossman, 311 Lincoln Rd., Miami Beach, Fla., archt., Morton R. Fellman, 1415 SW 1st. St., Miami, Fla., structural eng. and Sansvett Engr. Inc., 561 NE 79 St., Miami, Fla., mech. engr.

▲† **Blount Bros.**, Box 1114, Montgomery, Ala. CA **$1,421,000**; TRAINING SHOP BLDGS. 3 and 4, ENG 01-076-57-84, Redstone Arsenal, HUNTSVILLE, ALA. U. S. Eng., 2301 Grant St., Mobile, Ala. Bids June 5, awarded June 12. CD 6/10, under LB.

▲† **Blount Bros. Constr. Co.**, Box 1114, Montgomery, Ala. CA **$2,411,670**; 2 story, 24,160 sq. ft. each 3 class and laboratory bldgs., Redstone Arsenal, ENG 01-076-57-82. HUNTSVILLE, ALA. U. S. Engrs. 2301 Grant St., Mobile, Ala. Bids June 4. CD 6/10, under LB.

Gervais F. Favrot Co. Inc., 330 Balter Bldg., New Orleans, La., LB **$526,809**, (6 bidders), renovations to GIBSON HALL, on Campus, NEW ORLEANS, LA., Tulane University, St. Charles Ave., New Orleans, La., Freret & Wolf, 630 Gravier St., New Orleans, La., archts.

▲† **Struck Constr Co.**, 147 N. Clay St., Louisville, Ky., LB **$1,306,817**, est. $1,230,215, (5 bidders), 2 & 3 story brick, rein. conc. enlisted men's BARRACKS, ENG-15-029-57-80. FORT KNOX, KY., U. S. Eng., P. O. Box 59, Louisville, Ky., Bids June 11. CD 5/9.

▲ **L. A. Warlick Contr. Co.**, 747 E. 11th St., Chattanooga, Tenn., CA **$1,459,337**; constr. of a CENTRAL WING, Erlanger Hospital, CHATTANOOGA, TENN. Erlanger Hospital, Bd. Trustees, 241 Wiehl St., Chattanooga, Tenn., bids Apr. 9, awarded June 4, CD 5/1 under LB.

MIDDLE WEST

BUILDINGS—BA

Mich., Warren—MUNICIPAL BLDG.—BA 7/1—Twp., Hildegrade M. Lowe, city clk., 22720 Van Dyke St., municipal bldg., Van Dyke and Racine Sts. $540,000. Plans deposit $50, refundable. Clair W. Ditchy, 1231 South Woodward St., Royal Oak, Mich., archt.

O., Conneaut—SCHOOL ADDNS.—BA 7/9—Conneaut Bd. of Educ., 401 Mill St., Conneaut, Conneaut High School addns., alterations, $600,000. Plans deposit $50. Ward & Conrad, 226 Hanna Bldg., Cleveland, Zone 15, archts. Extended date. CD 6/7.

▲ **O., Cincinnati**—SCHOOL—BA 7/15—Oak Hill School Dist., 2900 Race Rd., Cincinnati, high school, Ebenezer Rd. $2,400,000. George Schatz & Assoc., 309 Ludlow Ave., archt. CD 4/10.

HEAVY CONSTRUCTION—LB & CA

Foley Constr. Co., 5050 Orchard St., Cincinnati, O., LB **$598,369** (6 bidders) cross county highway from Reading, Amberly Village, Galbraith to Ridge Ave., CINCINNATI, O. Hamilton Co. Bd. Comrs., Court House, Cincinnati, O. Bids June 11. CD 5/29.

▲ **Mary Const. Co. Inc.**, P.O. Box 423, Capt Girardeau, Mo., CA **$2,727,327**, widen 60 ft. channel to width of 225 ft., distance of 4 mi., Calumet Sag Channel Proj., near Chicago, ILLINOIS, U. S. Eng., 475 Merchandise Mart, Chicago 54, Ill. CD 4/18.

▲ **Fitz Simons & Connell Dredge & Dock Div.**, 10 S. LaSalle St., Chicago, Ill. and **S. A. Healy Co.**, 20 N. Wacker Dr., Chicago, Ill., LB **$12,371,000**, NW Expressway tri-level grade separation at Hubbard and Green Sts., CHICAGO, ILL., City Hall. Bids 5/29. CD 5/7.

WISCONSIN—State Hy. Comn., Madison, **Schuster Constr. Co.**, Denmark, CA **$556,299** (4 bidders) base and conc. 1.839 mi. West Mason St., City of Green Bay (Military Ave. to Ashland Ave.) S.T. Hy. 32 and 54, Proj. U 038-2(28), Contr. 1, Brown Co., Bids 6/4. CD 6/10, under LB.

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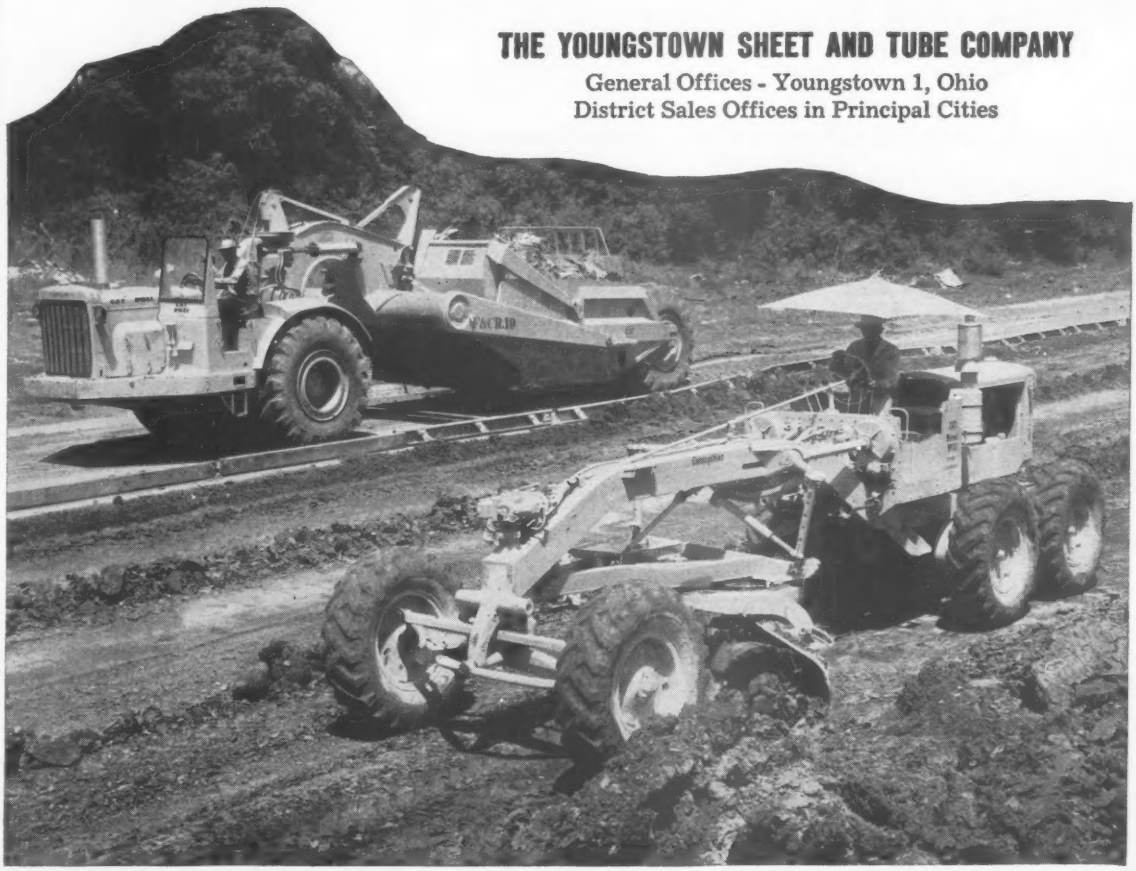

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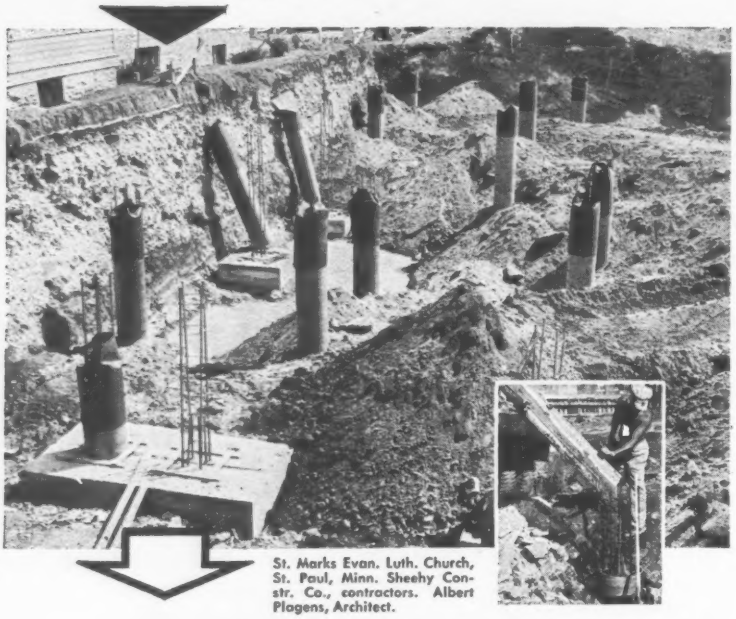

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BUILDINGS—LB & CA

▲ **Frank Messer & Sons, Inc.,** 4612 Paddock St., Cincinnati, O., LB $3,717,700, est. $4,000,000 (5 bidders) RENTAL UNITS, CINCINNATI, O. Cincinnati Metropolitan Housing Authority, 595 Armory St., Cincinnati, O. Bids June 6. CD 4/4.

Byrnes-Kraut Inc., 2272 Banning Rd., Cincinnati, O., Own forces, $725,000. 40 HOMES on extension of Golfway Acres, CINCINNATI, O. J. S. Wald Assoc., 2565 Galbraith St., Cincinnati, engr. Awarded June 6.

▲ **W. A. Carroll,** 570 Laramie St., Cincinnati, O., Own forces, $1,480,000. 40 HOMES in Wright Meadows, Wyoming, CINCINNATI, O. Rosendahl & Brown, 3123 Madison Rd., Cincinnati, archts.

Mohawk Constr. Inc., 7126 Montgomery Rd., Cincinnati, O. Own forces, $525,000. 15 HOMES, Glenmore Dr. off Montgomery Rd., CINCINNATI, O. W. Franklin, 2649 Erie Ave., Cincinnati, archt. Awarded June 12.

▲ **Columbus Pipe & Equipment Co.,** 763 E. Markison Ave., Columbus, O., Owner Builds $1,000,000. 3 concrete block, concrete, steel, TRAINING and office buildings at Woodrow Ave. and N.Y.C. R.R., south east of here, COLUMBUS, O. Western Electric Co., Lessee. Emrick, Albert & McGee, 539 S. Town St., Columbus, archts.

Upper Arlington Development Co., 1761 Tremont Center, Columbus, Zone 21, O., Owner Builds, $2,000,000. 20-unit SHOPPING CENTER and 500-auto parking center, Tremont and Zillinger Rds., COLUMBUS, O.

▲ **Chas V. Maescher Co.,** 2106 Florence St., Cincinnati, O., CA approx. $1,500,000. mfg. PLANT and office, Cooper Rd., LOCKLAND, O. Gardner Board & Carbon Co., 407 Charles St., Middletown, O. CD 5/22.

▲ **Construction Associates Inc.,** Logansport, Ind., LB $1,023,206, ARMORY buildings, Plymouth, Peru, Warsaw and Delphi, INDIANA. Indiana National Guard, State House, Indianapolis, Ind. CD 10/15/54 and 12/8/53.

▲ **Bd. of Trustees,** J. A. Franklin, vice-pres., Indiana University, Bloomington, Ind., rejected bids May 7, 5-story women's DORMITORY, three 2-story mens dormitories, dining hall, etc. Indiana University, BLOOMINGTON, IND., Est. $3,000,000-$4,000,000. Will re-advertise. CD 4/3.

Glen Constr. Co., A. R. Cooper, pres., 1930 Edison Ave., Granite City, Ill., Owner builds, $560,000, 70 addnl. RESIDENCES in section 4 of Glenview, GRANITE CITY, ILL.

O. & O. Constr. Co., 20 Greenbay Rd., Winnetka, Ill., LB $551,526, 2-story, brick high SCHOOL addn., GRAYS LAKE, ILL., Grays Lake Comn. High School Distr. 127, 400 N. Lake St., Grays Lake, Ill. CD 5/9.

▲ **Edward Rose & Sons,** 14900 Linwood St., Detroit, Mich., Owner Builds, $1,700,000. 112 brick houses, Fleming Drive, Mott and Pierson Rds., section, FLINT, MICH.

▲ **C. H. Reisdorf & Sons,** 9353 Freeland St., Detroit, Mich., CA $1,080,000. 72 unit HOUSING, Polk and Beechwood Sts., and 28 units housing, Geedal St., RIVER ROUGE, MICH. River Rouge Public Housing Comn., River Rouge, Mich. Bids June 5. CD 521.

WEST OF MISSISSIPPI

BUILDINGS—BA

Kan., Great Bend—SCHOOL—BA 7/2—Bd. Educ., City, City Hall, junior high school, $965,000. Hibbs, Robinson & Pettit, 519 S. Broadway, Kansas City, Mo., archts. CD 1/18.

▲ **Mont., Columbia Falls**—SCHOOL—BA 7/12—Columbia Falls High School Dist., high school. $1,490,000. CD 11/12.

HEAVY CONSTRUCTION—LB & CA

▲ **Woemann Constr. Co.,** 3800 West Pine Blvd., St. Louis 8, Mo. CA $2,943,000. distributive PUMPING STATION, At Chain of Rock Plant, Water Division, on Mississippi River, ST. LOUIS, MO. City, Frank J. McDevitt, pres., Bd. P. Service, 304 City Hall, 12 Blvd. and Market St., St. Louis 3, Mo., Bids June 4. CD 6/6.

▲ **SOUTH DAKOTA**—State Hy. Dpt., Pierre, **John F. Beagley Construction Co.,** 20 N. Wacker St., Chicago, Ill., CA $2,948,952 (5 bidders), superstructure for bridge over Missouri River 0.95B mi. Proj. No. WAR 180(1), Corson and Walworth Counties. Bid date June 11. CD 5/15.

▲ **SOUTH DAKOTA**—State Hy. Dpt., Pierre, S. D.—**J. L. Healy Construction Co.,** 301 Western Surety Bldg., Sioux Falls, S. D., CA $129,794, (5 bidders) base course and bit. surf. 7.699 mi. Proj. 8 S 3430 (1) & Spur, Minnehaha Co.; CA $305,538, (20 bidders) base course repair and bit. surf. 14.977 mi. Proj. No. 3 F 030-1(1) & F 030-2 (1), Hughes and Hyde Counties; CA $84,248 (8 bidders), base course and bit. surf. 5.43 mi. Proj. No. 6 S 3280(1), Lake Co.; CA $296,856 (10 bidders), base course repair and bit. surf. 15.188 mi. Proj. No. 5 F 051-3 (1), McCook Co.

S. D.—**Mannerud Brothers,** Brookings, S. D., CA $102,446, (11 bidders), grading, sub-base 5.49 mi. Proj. No. 15 F 047-2(2) & F 016-3(1), Hutchinson Co.

S. D.—**Johnson Brothers,** Ft. Pierre, Pierre, S. D., CA $221,652 (8 bidders) grading, sub-base, 11.03 mi. Proj. 16 F 047-6(1), Spink Co.

S. D.—**S. E. Gustafson Constr. Co., Inc.**, W. 12, Sioux Falls, S. D., CA **$138,037**, (11 bidders), grading, subbase, etc. 7.658 mi. Proj. No. 14 S 1971 (1), Douglas Co.

S. D.—**W. E. Bartholow & Son Constr. Co.**, Huron, S. D., CA **$149,853**, (3 bidders), base course and bit. surf. 1.184 mi. Proj. No. F 047-5(1), Beadle Co.

S. D.—**Carlson-Lien Co.**, Rapid City, S. D., CA **$435,642**, (13 bidders), base course repair and bit. surf. 18,746 mi. Proj. No. F 032-4(1), Dewey Co.

S. D.—**Highway Construction Co.**, Rapid City, S. D., CA **$749,896** (13 bidders), grading, etc. 5.148 mi. Proj. WAR 180 Section 2, Corson Co.

S. D.—**G. H. Lindekugel & Sons**, Mitchell, S. D., CA **$427,392** (9 bidders), base course repair and bit. surf. 24.816 mi. Proj. No. I 092-4 & I 092-5 (St. Wk.), Jackson and Jones Counties.

S. D.—**Rand Construction Co.**, 636 St. Anne, Rapid City, S. D., CA **$114,324** (1 bidder), grading, etc., part base course and bit. surf. and part grav. surf. 6.964 mi. Proj. No. S 258 (1), Edmunds Co.

S. D.—**Western Engineering Co.**, Harlan, Iowa, CA **$118,832**, (6 bidders), base course and bit. surf. 6.071 mi. Proj. No. S 3830(1), Lincoln Co. Bid date June 11, Grand Total $3,274,610. CD 5/31.

▲ **OKLAHOMA**—State Hy. Dpt., Capitol 5, Oklahoma City,

Okla.—**Fischer Construction Co.**, Sec. Nat'l. Bk. Bldg., Norman, Okla., CA **$145,161**, est. $158,703, three concrete and steel bridges on US No. 77 near Goldsby, McClain Co.

Okla.—**Mosher & Kiker**, 810 S. Duane, El Reno, Okla., CA **$137,533**, Est. $130,891, three hy. grade separations on US No. 77 near Braman, Kay Co.

Okla.—**Henryetta Const. Co.**, Henryetta, Okla., CA **$513,928**, Est. $525,257, four hy. grade separations on US No. 66 by pass; Tulsa Co.

Okla.—**Admiral Paving Co.**, 5501 E. Admiral, Tulsa, Okla., CA **$550,901**, Est. $807,812, eight concrete and steel bridges on four-lane US No. 66 by-pass, Tulsa Co.

Okla.—**J. A. Raines**, 2311 Callohan St., Muskogee, Okla., CA **$111,823** Est. $115,132, three concrete and steel bridges on US No. 75 north of Okmulgee County line, Tulsa Co.

Okla.—**Gregg Const. Co.**, Henryetta, Okla., CA **$517,327**, Est. $534,740, three concrete and steel bridges on US No. 60 in and west of Pawhuska, Osage Co.

Okla.—**Suddreth Const. Co.**, Fidelity Bank Bldg., Oklahoma City, Okla., CA **$252,542** Est. $279,914, three concrete and steel bridges on US No. 66 east of Washita County line, Custer Co.

Okla.—**Oklahoma Paving Co.**, 4131 N. Portland, Oklahoma City, Okla., CA **$614,878**, Est. $685,689 concrete and steel bridge over S. Canadian River on US No. 183 at Taloga, Dewey Co. Bids June 11, CA 6/11, Grand Total $2,844,093, CD 6/3.

OKLAHOMA—State Hy. Dpt., Capitol 5, Oklahoma City,

Okla.—**Ben Haskus**, Cordell, Okla., CA **$115,605**, Est. $128,806, grading and draining 7.859 mi. on county road east of Blair, Jackson Co.; CA $420,738, Est. $471,298, grading and draining 6.15 mi. on US No. 66 east of Washita County line, Custer Co.

Okla.—**Cozad Const. Co.**, Sulphur, Okla., CA **$590,644**, Est. $559,689, grading and draining 7.818 mi. on Hy. No. 21 east of Broken Bow, McCurtain Co.

Okla.—**Broco Const. Co.**, Woodward, Okla., CA **$90,905**, Est. $87,014, grading, draining, asph. stab. base and single bit. surf. 1.222 mi. Hy. No. 54 through Texhoma, Texas Co.; CA $967,720, Est. $922,118, grading, draining stab. aggreg. base and b. conc. surf. 9.99 mi. US No. 77 south of Kansas State Line, Kay Co.

Okla.—**Burbank Rock Co.**, Ponco City, Okla., CA **$204,395**, Est. $205,935, grading and draining 2.004 mi. US No. 60 west of Pawhuska, Osage Co.

Okla.—**F. I. Gaines & Sons**, Miami, Okla., CA **$101,610** Est. $95,865, grading and draining 6.235 mi. on Hy. No. 10 east of Nowata County line, Craig Co.

Okla.—**Progress Const. Co.**, Barnes Bldg., Muskogee, Okla., CA **$163,003**, Est. $207,160, grading and draining 4.161 mi. US No. 66 east from Chelsea, Rogers Co.

Okla.—**A. K. McBride**, 2914 O Street, Fort Smith, Okla., CA **$207,520**, Est. $265,999, grading and draining 6.784 mi. US No. 75 through Glenpool, Tulsa, Co.

Okla.—**Curtis Const. Co.**, North Lewis Rd., Tulsa, Okla., CA **$191,907**, Est. $202,621, c. conc. pavt. 0.744 mi. US No. 60 west of Pawhuska, Osage Co.

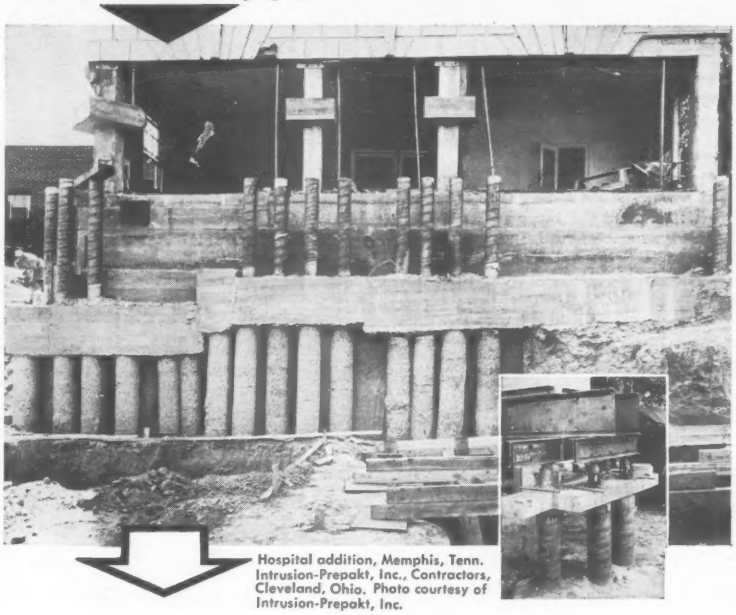
Okla.—**Dahlgren Const. Co.**, Commerce Exch. Bldg., Oklahoma City, Okla., CA **$862,022**, Est. $866,058, b. conc. pavt., sand-asph. base 6.175 mi. US No. 66 east of Washita County line, Custer Co.

Okla.—**Boecking Const. Co.**, 2810 N. McArthur, Oklahoma City, Okla., CA **$1,070,176**, est. $1,056,679, c. conc. pavt. 4.022 mi. US No. 270 west Shawnee, Pottawatomie Co.

Okla.—**Ryan & Phelps**, 7512 N. Western, Oklahoma City, Okla., CA **$942,026**, est. $930,209, soil cement base and b. conc. surf. 7.043 mi. on US No. 66 east of Sayre, Beckham Co.

Okla.—**Hunter Const. Co.**, Ada, Okla., CA **$1,051,490**, est. $1,051,792, soil cement base and b. conc. surf. 6.728 mi. US No. 77 through Goldsby, McClain Co.

Building load temporarily transferred from footing to piles



Hospital addition, Memphis, Tenn. Intrusion-Prepakt, Inc., Contractors, Cleveland, Ohio. Photo courtesy of Intrusion-Prepakt, Inc.

Pile extensions formed with SONOCO SONOTUBE® Fibre Forms

Eighteen-inch diameter cast-in-place Intrusion grout piles were used as a temporary support for this hospital addition.

The pile extensions above grade were formed by Sonoco SONOTUBE Fibre Forms and took building loads off footings during underpinning with concrete slab.

Upon completion of the underpinning, the load was transferred and the pile extensions cut off.

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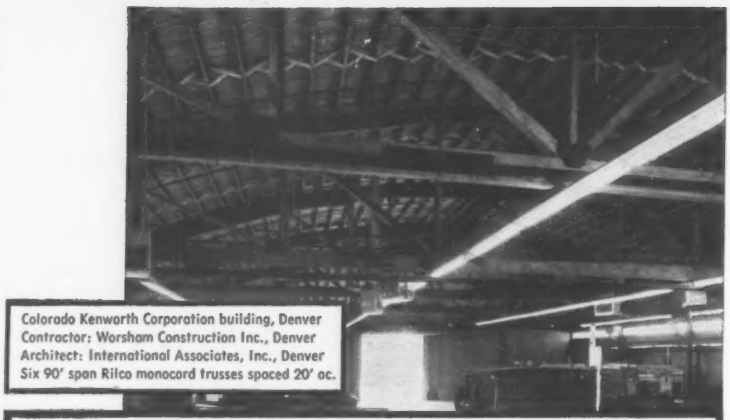

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Contractor: Worsham Construction Inc., Denver
Architect: International Associates, Inc., Denver
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Okla.—**McConnell Const. Co.**, 5070 N.W. 16th, Oklahoma City, Okla., CA **$622,574**, est. $599,023, stab. aggreg. base and b. conc. surf. 2.894 mi. US No. 77 east of Goldsby, McClain Co.

Okla.—**Pool Const. Co.**, Box 540, Shawnee, Okla., CA **$115,838**, est. $125,035, stab. aggreg. base and double bit. surf. 5.729 mi. on county rd., Leflore Co.

Okla.—**Layman & Son**, 3001 Riverside, Tulsa, Okla., CA **$1,080,470**, est. $1,081,622, stab. aggreg. base and b. conc. surf. on 4-lane US No. 66 by-pass in Tulsa, Tulsa Co.

Okla.—**Amis Const. Co.**, 1647 Exchange Ave., Oklahoma City, Okla., CA **$735,214**, est. $719,861, stab. aggreg. base and b. conc. surf. 3.237 mi. on US No. 66 by-pass at Tulsa, Tulsa Co. Bids June 11. CA June 11. Grand total $9,463,281. CD 5/31.

▲† **C. F. Lytle Co.**, 250 Ins. Exchange Bldg., Sioux City, Iowa, LB **$1,707,145**; est. $1,956,682; Vega Dam and relocation of County Rd., Collbran Proj. near Collbran, Colo., Spec. DC 4898, COLORADO. Bureau Reclamation, Dpt. Interior, Post Office Bldg., Grand Junction, Colo. Bids June 6. CD 4/16.

† **I. F. Scholes of Arkansas Inc.**, P. O. Box 757, Colorado Springs, Colo., CA **$788,191**, utilities area distr., Phase II, IFB 05-613-57-28, Air Force Academy, COLORADO SPRINGS, COLO. Dpt. of Air Force, Box 1670, Colorado Springs, Colo. Bids May 14, awarded May 27. CD 5/22, under LB.

Haggerty-Messmer Co., Bozeman, Mont., LB **$1,157,715**, est. $1,232,144 (3 bidders) imprvs. and expan. of city municipal water supply sys., BOZEMAN, MONT. City, City Hall, Bozeman, Mont. Bids June 12. CD 5/22.

BUILDINGS—LB & CA

▲† **Gale Goodwin**, 724 Quincy St., Rapid City, S. D., LB **$1,078,519**, Defense Area FAMILY HOUSING, Ellsworth Air Force Base, Inv. 25-066-57-100, RAPID CITY, S. D. U. S. Eng., 1709 Jackson St., Omaha, Nebr. Bids June 13. CD 5/21.

Cain & Cain, 4001 S. Expressway, Fort Worth, Tex., LB **$579,469**, est. $575,000, constr. 2 story brick, tile, concrete and steel HIGH SCHOOL ADDN., BIRDVILLE, TEX. Birdville Independent School Dist., 3120 Carson St., c/o W. G. Thomas, Supt., Fort Worth, Tex. Bids June 11. CD 5/28.

FAR WEST

BUILDINGS—BA

Calif., El Camino—STORAGE BLDG.—BA 7/9—El Camino Junior College, 16007 Crenshaw Blvd., Los Angeles, tilt-up concrete maintenance and storage bldg. athletic bldg., $725,000; extended date. Smith Powell & Morgridge, 208 W. 8th St., Los Angeles, Calif., archts., CD 6/11.

▲ **Calif., Fresno**—SCHOOL—BA 7/10—Fresno City Unified School Dist., 2348 Mariposa St., 190,000 sq. ft., C. L. McLane High School, **$3,460,000**; Plans deposit $100 for segregated bids. $200 for complete set. Swartz & Hyberg, Rowell Bldg., Fresno, archts., F. W. Kellberg, Mason Bldg., Fresno, Calif., engr. CD 12/20.

Calif., Los Angeles—FOUNDATIONS—BA 7/10—Los Angeles Co. Bd. Suprvs., 501 Hall of Records, foundations for hall of administration, civic center, Cap Proj. 7005 Spec. 1772-F; $500,000; Plans deposit $20. J. F. Stanton & Wm. F. Stockwell, Paul R. Williams, Adrian Wilson; Austin Field & Fry, 627 S. Carondelet St., Los Angeles, Calif., archts. CD 12/5.

HEAVY CONSTRUCTION—LB & CA

▲† **N. M. Sundt Constr. Co.**, 440 South Park St., Tucson, Ariz., LB **$2,541,151**; (5 bidders) NATIONAL GUARD FACILITIES, Tucson Municipal Airport, ENG 04-353-57-107 TUCSON, ARIZ. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif., Bids June 13, CD 5/23.

▲† **Washington**—Chelan County Public Utility Distr., 327 N. Wenatchee Ave., Wenatchee,
Morrison-Knutsen Co. Inc., 319 Broadway, Boise, Idaho; **Henry J. Kaiser Co.**, Kaiser Bldg., Oakland, Calif; **Peter Kiewit Sons Co.**, 1024 Omaha National Bank Bldg., Omaha, Neb., and **Perini Corp.**, 73 Montwait Ave., Framingham, Mass. LB **$58,561,522** (2 bidders), completion of the general work on Rocky Reach Dam. Bids 6/14. CD 5/8.

Tullar Power Constr. Co. Inc. & Assocs., 3214 West McGraw St., Seattle, Wash. LB **$2,600,994**, electrical contract.

▲† **Marshall & Haas**, P. O. Box 95, Belmont, Calif., CA **$1,186,826**; constr. earthwork, concrete canal lining and structures for 8.5 mi. section of Putah South Canal, Solano Project, DC 4881, CALIFORNIA. Bureau Reclamation, Dpt. Interior, Winter, Calif., Bids May 8, CD 5/19 under LB.

CALIFORNIA—Bureau Pub. Rds., Old Mint Bldg., 5th and Mission Sts., San Francisco,
Calif.—C. S. Phillips, P. O. Box 758, Petaluma, Calif., CA $778,389; 7 mi. hy. beginning near Grass Lake and extending to intersection with U. S. Hy. 50 near Myers, FH 43-A, El Dorado National Forest, El Dorado Co., S. E. Farin, Old Mint Bldg., San Francisco, Calif., regional engr., awarded June 6, CD 5/31 under LB.

† **Maino Constr. Co., Schmid & Wiswell**, 2238 S. Broad St., San Luis Obispo, Calif., CA **$504,437**; addnl. AVIATION FACILITIES, San Nicholas Island, Spec 9963-56, POINT MUGU, CALIF. Eleventh Naval Dist., 1220 Pacific Hy., San Diego, Calif. Bids June 4, awarded June 5, CD 6/14 under LB.

† **Kemper Constr. Co., Hoagland-Findlay Eggr. Co.,** 3254 Cherry Ave., Long Beach, Calif., CA **$593,529;** (8 bidders) replace and relocate steam lines, U. S. Naval Repair facility, Spec 9954; SAN DIEGO, CALIF. Eleventh Naval Dist., 1220 Pacific Hy., San Diego, Calif., Bids June 5, Awarded June 7, CD 8/27.

BUILDINGS—LB & CA

▲† **Rutherford Constr. Co.,** P. O. Box 915 Albuquerque N. M., LB **$1,369,000;** (5 bidders) enlisted men's barracks, army electronic proving ground ENG 04-353-57-92. FORT HUACHUCA, ARIZ. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif., Bids June 11, CD 5/13.

▲ **Austin Co.,** Terminal Sales Bldg., Portland, Ore. CA **$2,000,000.** SAWMILL Modernization, BEND, ORE. Brooks-Scanlon Inc., Bend, Ore. Freeman Schultz, c/o owner, engr. Awarded June 10.

Warner Bros Co., 4000 Warner Blvd., Burbank, Calif. Owner builds. **$500,000;** 30,000 sq. ft. OFFICE BLDG. 4,000 Warner Blvd., BURBANK, CALIF.

Windsor Constr. Co., 2514 W. Vernon Ave., Los Angeles, Calif. CA $682,000; 1004-1222 sq. ft., 62 DWELLINGS Roding St., Andle Ave., Ketterin St., LANCASTER, CALIF. Vista Land Co., 2514 W. Vernon Ave., Los Angeles, Calif.

▲ **D&E Corp.,** 8906 W. Olympic Blvd., Beverlyy Hills, Calif. Owner builds. **$2,534,000;** 219 DWELLINGS, Tr. 21872; MONTEREY PARK, CALIF.

CANADA

HEAVY CONSTRUCTION—LB & CA

ALBERTA—Dpt. P. Sk., Hunter Bldg., Ottawa, Ont.
McNamara Constr. Co. Ltd., 42 Industrial St., Leaside, Toronto, Ont., CA $643,470, bit. stab. base course Mile 2 to Mile 22, Banff-Jasper Hy. Banff National Park. Awarded May 31. CD 5/27, under LB.

BRITISH COLUMBIA—Dpt. P. Wks., Hunter Bldg., Ottawa,
Assinboia Constr. Co. Ltd., P. O. Box 398, Calgary, Alta., CA **$705,714.** bit. stab. course 7 mi. Trans-Canada Hy. Yoho National Park. CD 5/13, under LB.

▲ **Standard Gravel & Surfacing of Canada Ltd.,** 5340 1st St. S.W., Calgary, Alta. and **Poole Engr. Co. Ltd.,** 10503 109 St., Edmonton, Alta., LB **$4,918,016;** (2 bidders) bit. runway, 6,000 ft. by 200 ft., Norman Wells Airport, NORMAN WELLS, NORTHWEST TERRITORIES, Dpt. of Transport, Hunter Bldg., Ottawa, Ont. Bids May 20. CD 5/6;
Burns & Dutton Concrete & Constr. Co., Ltd., 9004 125th Ave., Edmonton, Alta. LB **$143,214** (2 bidders) staff dwelling and operations bldg. and related work, Norman Wells Airport, (Norman Wells, Northwest Territories).

ONTARIO—Dpt. Hys., Parliament Bldgs., Toronto.
Standard Paving & Materials Ltd., 402 Harbour Bldg., Toronto, Ont., CA **$594,797** (15 bidders) Contr. 57-92, grading, gran. base, hot mix paving 5.41 mi. Hy. 401, Kingston. Bids June 5. CD 5/20.

ONTARIO—Dpt. Hys., Parliament Bldgs., Toronto,
Curran & Briggs Ltd., 61 Haverson Blvd., Toronto, Ont., CA **$588,208** (7 bidders) Contr. 57-67, Mississauga Rd. interchange about 1 mi. west of Port Credit. Bids June 5. CD 5/20.

Foundation Co. of Canada Ltd., 1220 Bay St., Toronto, Ont., LB **$663,746** (3 bidders) remodeling and extension of existing Humber Bridge on Lakeshore Rd., part of Lakeshore Expressway, TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St E., Toronto, Ont. Bids June 10. CD 5/27.

BUILDINGS—LB & CA

Argo Constr. Ltd., 18 Gladstone Ave., Montreal, Que., CA Est. **$500,000** (9 bidders) 3 story, 46x182 ft., rein.-con., structural steel frame, masonry, Division OFFICE, ST. JOHN'S, NEWFOUNDLAND. Imperial Oil Ltd., 56 Church St., Toronto, Ont. Bids May 30, awarded June 7. CD 5/16.

Shore & Horwitz Constr. Co. Ltd., Box 257, Station "B", Ottawa, Ont., CA **$719,880.** 2 story, bsmnt., 105x238 ft., brick, structural steel frame, FINANCE bldg., Tunney's Pasture, OTTAWA, ONT. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Bids May 8, awarded May 31. CD 5/22, under LB.

▲ **Terroux Constr. Ltd.,** 19 Old Church Ave., Beaconsfield, Que., CA Est. **$1,000,000.** HOUSING Program, Old Patton farm at Doneghani Ave., MONTREAL, QUE. Lakeside Apartments Inc., 19 Old Church Ave., Beaconsfield, Que. Wm. R. Green, 4 Chester Ave., Valois, archt. Awarded June 10.

▲ **College Park Development Ltd.,** 590 Crevier St., Montreal, Que., Owner Builds. **$1,250,000.** HOUSING Program, Harstenstein Ave., MONTREAL, QUE.

PROPOSED PROJECTS

WATER SUPPLY

Ill., **Morton**—Village, Village Hall, water mains and connections, Belt Line Main, $150,000. Crenshaw & Jost, 612 Court St., Pekin, consult. engrs.

Mass., **Acton**—Town, Bd. Health, Town Hall, water control, **$60,000.** Tekton Assoc. Inc., 23 Washington St., Natic, consult. engr. 1958 constr.

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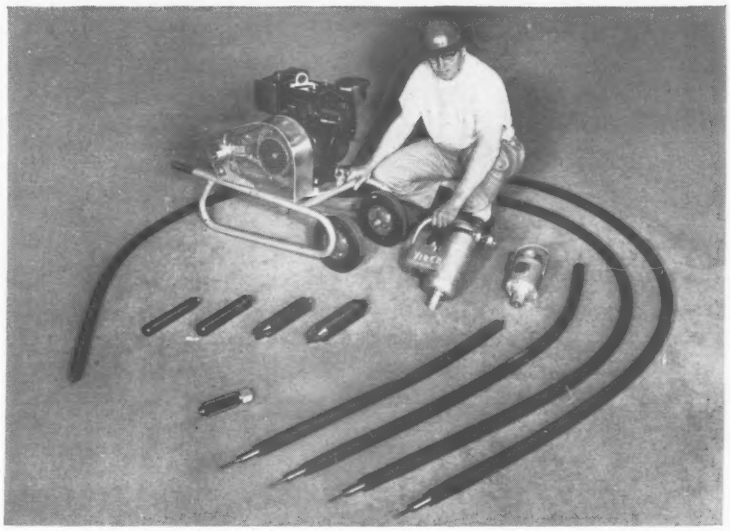

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Okla., Tonkawa—City, City Hall, defeated bonds June 4, waterworks exten. $125,000. CD 5/2.

Tex., Cameron—City, City Hall water filtration plant 2,000,000 gal. plant, sedimentation basins, etc. $200,000. Joe J. Rady, 511 Insurance Bldg., Fort Worth, consult. eng. CD 9/19.

Utah, West Bountiful—Town Bd., Bernard S. Walker, pres., voted bonds for well and 500,000 gal. reservoir, $185,000. Templeton & Linke, 500 Dooly Bldg., Salt Lake City, consult. engrs. Bids soon. CD 6/28.

Que., Orsainville—Municipality of Orsainville, WW and sewers. $100,000.

SEWERS, WASTE DISPOSAL

Calif., Corte Madera—Sanitary Dist. No. 2, 500 Tamal Pais Dr., sewage treatment plant, pumping plant, sewer lines, $600,000; Brown & Caldwell, 66 Mint St., San Francisco, Calif., consult. engrs.

▲ **Calif., San Jose**—City, City Hall, voted bonds June 11, sewer outfall, $1,500,000; CD 5/14/56.

Fla., Miami—City Comrs., City Hall, 3332 Pan American Dr., Miami, sanitary sewers northeast of here, east of Biscayne Blvd. and north of Little River Canal, $415,000. CD 9/28/56.

Ill., Dupo—City, Mayor Norman Smothers, City Hall, storm sewer constr. $293,000 and extensions of sanitary sewer sys. $115,000, CD 11/30/56 under LB.

Kan., Raytown—City, City Hall, bond election June 25th, $1,085,000 main trunk lines, $1,727,000 extension sanitary sewers; $450,000 imprv. sanitary sewers; B. L. Oliver & Co., 1805 Grand St., Kansas City, Mo., consult. engrs.

Mass., Springfield—City, Bd. Supervisors, Dpt. Sts. & Engr. Admin. Bldg., sewers, Approx. $75,000. CD 1/13/54.

▲ **O., Hamilton**—City, City Hall, bond election Nov. 5, storm sewers and drainage ditches in all sections of city, $2,000,000; sanitary sewers in various sections of city and enlarging of existing sewers, $1,500,000; CD 3/6/44.

O., Hudson—Bd. P. Affairs, rehabilitate disposal plant and sewer system, $400,000.

▲ **Pa., Conshohocken** — Whitemarsh Twp. Bd. Suprvs., sewage disposal plant, Lafayette Hills, $1,000,000. Glace & Glace, 1001 N. Front St., Harrisburg, Pa., consult. engrs.

▲ **Tex., Beaumont**—City, City Hall, voted bonds June 1, sewage disposal plant, $200,000; sanitary sewer lines, $750,000; storm sewers, $100,000, for Voth-Rosedale areas. CD 11/15/55.

Utah, West Jordan—City, Citizen's Sewer Co., J. J. Schmidt, Chrm., voted bonds, sewage collection sys., $750,000. Caldwell, Richards & Sorensen, 408 Zion's Savings Bldg., Salt Lake City, consult. engrs. CD 11/21/46.

Wash., Renton—City, City Hall, sanitary sewer for Maplewood area with trunk sewer to city sys., $107,000.

BRIDGES

▲ **Conn., Hartford**—Greater Hartford Bridge Auth., 71 Capitol Ave., Hartford, rebuilding Bulkeley Bridge across Connecticut River, incl. addnl. traffic lane, widening accesses at both ends of center barrier, East Hartford and Hartford, $1,000,000. CD 4/11/56.

▲ **O., Hamilton**—City, City Hall, bond election Nov. 5, bridge across Great Miami River at South Ave., $2,000,000; CD 11/10/53.

STREETS AND ROADS

▲ **ARKANSAS**—State Hy. Dpt., State Capitol, Little Rock,
Jefferson Co.—8 mi. super-hy. to leave present hy. 65 at a point north of Pine Bluff, traverse part of the old Arkansas river bed north of city, then traverse around eastern side of city to join present rte. at point east of city. The Rte. would begin with an interchange which would be adaptable to connection with a limited access hy. to Little Rock. $13,500,000; Wilbur Smith & Assocs., 265 Church St., New Haven, Conn., consult. engrs.

▲ **Calif., San Jose**—City, City Hall, voted bonds June 11, streets imprvs. $12,350,000; CD 5/14/56.

Ill., Dupo—City, Mayor Norman Smothers, City Hall, constr. street, curbing and street drainage imprvs., $212,000.

▲ **MASSACHUSETTS**—Commonwealth of Mass., MDC, Constr. Div., 20 Somerset St., Boston, boulevard from Veterans of Foreign Wars Parkway to Baker St., and make access to new Recreation Reservation on Charles River, West Roxbury, $3,000,000.

Mass., Lexington—Town, Bd. Selectmen, Town Office Bldg., rd. constr. and 4 mi. bit. conc. sidewalks, $75,000. Whitman & Howard Inc., 89 Broad St., Boston, consult. engr. 1957 constr.

Tex., Crane—City, and Crane Co., bond election June 22, imprvs. to city streets and county roads. $150,000.

Tex., Crockett—City, City Hall, street imprvs. and paving, $175,000. CD 9/29/54.

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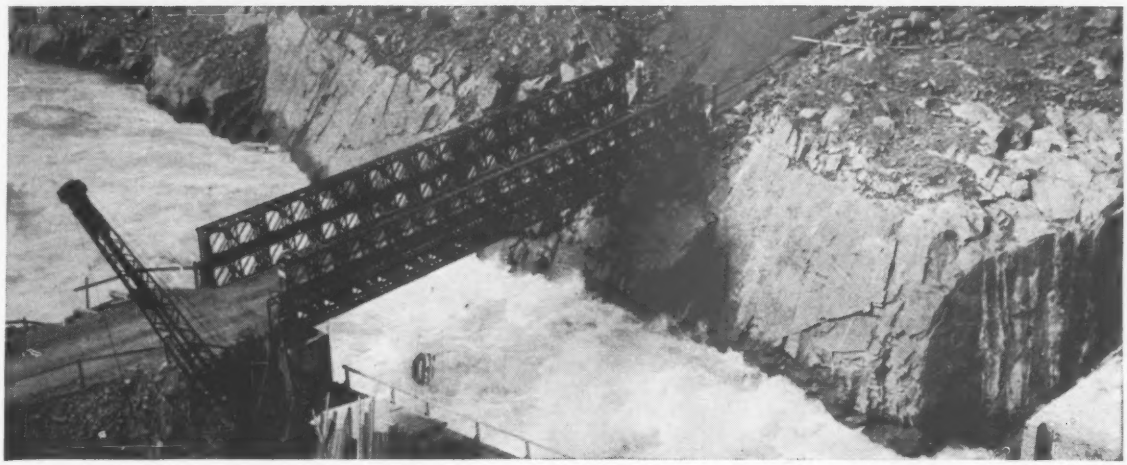

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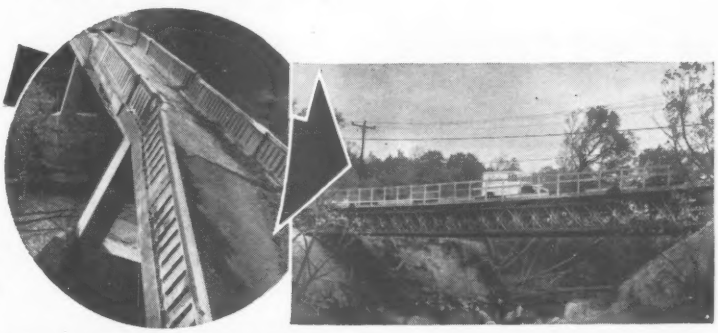

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▲ **Calif., Hollister**—San Benito Flood Control and Water Conservation Dist., Court House, bond election June 25, dam and reservoir in Hernandez Valley, Flood Control Zone 3, $1,250,000.

Tex., Corpus Christi—John L. Tompkins & Co., Jones Bldg., constr. network canals, giving water frontage to inland homes now being planned, $500,000; turning basin in a side channel stemming from Main Canal, $160,000; both in Padre Island area.

▲ **Ontario**—Ausable River Conservation Authority, J. A. Morrison, chn., Parkhill, dam on Mud Creek, $1,000,000. M. S. Dillon & Co., 141 Maple St., London consult. engrs. CD 6/7.

AIRPORTS

▲ **Calif., San Jose**—AIRPORT ADMINISTRATION BLDG., etc.—City, City Hall, voted bonds June 11, airport administration bldg. and runway extensions, $3,500,000.

Me., Saco—TAXIWAY etc.—City, 300 Main St., airport constr. incl. taxiway, runway, auto park & entrance rd., Approx. $80,000. 1957 constr.

Me., Wiscasset—AIRPORT—Bd. Selectmen, Town Hall, airport constr., Rte. No. 1, Approx. $75,000.

PUBLIC BUILDINGS

Calif., Etna—SCHOOL—Etna Union High School Dist., c/o Supt., plans by Lawrence L. Thomson, 125 W. 3rd St., Chico, archt., Etna Union High School, $966,000; Kellberg, Paquette & Maurer, 114 Market St., San Francisco, Calif., consult. engrs., CD 12/13.

▲ **Calif., San Jose**—FIRE STATIONS—City, City Hall, voted bonds June 11 fire stations, $1,900,000.

▲ **Calif., San Jose**—CIVIC AUDITORIUM—City, City Hall, voted bonds June 11, civic auditorium, $450,000; CD 8/5/48.

▲ **Calif., San Jose**—East Side Union High School Dist., North White Rd., voted bonds June 11, two school addns., $2,900,000; bids July or August. CD 4/22/55.

Calif., Stockton—FIRE STATIONS—City, City Hall, fire station, $630,000. Constr. 1959.

Conn., Fairfield—Town, Town Hall, plans by Lyons & Mather, 211 State St., Bridgeport, Roger Ludlowe High School addn. $463,850.

▲ **Conn., Wethersfield**—LIBRARY, etc.—Town, Town Hall, plans by Ebbets, Frid & Prentice, 862 Asylum Ave., Hartford, 3 story 72x120 ft. masonry library and 56x156 ft. town hall, Silas Deane Hy. $1,350,000. CD 5/2/56.

Ind., Richmond—JAIL—Wayne County, Comrs., Courthouse, county jail, west of courthouse, $500,000. CD 1/25/46.

▲ **Iowa., Fort Madison**—SCHOOL—Bd. Educ., Fort Madison, $950,000 voted bonds Apr. 29, remodeling present high school into junior high school and new senior high school, $1,138,000. Plans by Karl Keffer, Assocs., 202 Masonic Temple Bldg., Des Moines, Iowa, archts. CD 4/30.

▲ **Kan., Hill City**—SCHOOL—Rural High School Dist. No. 3, defeated $700,000 bonds May 21, high school, $700,000. George Tewksbury, Mission, Kan., archt.

▲ **Kan., Russell**—SCHOOL—Bd. Educ., Russell, defeated $1,950,000 bonds May 21, high school, $1,950,000. E. M. Fuller, 701 E. 14 St., North Kansas City, Mo., archt.

Me., Rockland—SCHOOL—Town, Bruce J. Kenney, Supt. of Schools, High school, $350,000. Constr. 1958.

Me., Westbrook—SCHOOL—Town, School Dpt., Westbrook, elementary school, Monroe, Oakind Ave. Dist., $350,000. Constr. 1958.

Mass., Ashburnham—SCHOOL—Town, School Dpt., plans by Julian W. Goodrich, 930 Shelburne Rd., South Burlington, Vt., Jr.-Sr. high school, $850,000. 1958 constr. CD 4/4.

Mass., Beverly—HOUSING—City, Housing Auth., 49 Story Ave., Beverly, Section 2, 30 units, housing for the elderly, $350,000. 1958 constr.

Mass., Harwich—SCHOOL—Town, Schools, South St., Henry T. Wing School, alterations and addns. $350,000. 1957-58 constr.

▲ **Mass., North Adams**—SCIENCE-GYMNASIUM—Commonwealth of Mass., Dpt. Education, c/o Div. Bldg., Constr., 38 Chauncy St., Boston, plans by William Hoskins Brown Assoc. Inc., 344 Boylston St., Boston, E-57-14, Science, Gymnasium & Auditorium Bldg., $1,200,000. Maurice A. Riedy, 101 Tremont St., Boston, struc. engr. CD 12/6/56.

Mass., Walpole—SCHOOL—Town, Supt. Schools, elementary school, Plain St. Area, $350,000. 1958 constr.

Mass., Worcester—FIRE PROTECTION—Commonwealth of Mass., Dpt. Mental Health c/o Div. Bldg. Constr., 38 Chauncy St., Boston, plans by Desmond & Lord, 6 Beacon St., Boston, M-209, fire protection, state hospital, Thaymer, Folsom & Quinby bldgs., $600,000. late 1957 constr.

Mo., Camdenton—SCHOOLS—Camdenton Reorgnized School Dist., R-3, Camdenton Co., Supt. of Schools, defeated $598,000 bonds June 4, schools, $598,000. Eugene F. Johnson & Assocs. Inc., 400 East McCaniel St., Springfield, Mo., archts. & engrs. CD 5/22.

▲ **Mo., Fulton**—EDUCATIONAL FACILITIES—Missouri School for the Deaf, Fulton, plans by Marcel Bulicault, 411 N. 7th St., St. Louis, 2 story rein. conc. frame, masonry, aluminum, stone trim buildings incl. functional living and educational facilities with bsmnts. for secondary activities, $2,440,800. CD 2/1/56.

Mo., Hazelwood (St. Louis P. O.)—SCHOOL—School Dist. R-1, St. Louis County, Bd. Educ., Clifford Kirby, supt. Schools, 1865 U. S. Hy. 86, Zone 15, voted $500,000 bonds June 7, elementary school on Howdershell Rd. and Lusher elementary school addn. CD 5/9.

N. H., Concord—HIGH SCHOOL ADDN.—City, School Dpt., Parker School Bldg., plans by Alonzo J. Harriman, Inc., 292 Court St., Auburn, Me., high school addn., $350,000; Constr. 1958. CD 5/1/53.

N. J., Hightstown—SCHOOL—Bd. Educ., East Windsor, plans by Mickelwright & Mountford, E. Stuyvesant Ave., Trenton, N. J., addn. to Walter Black School, $450,000, CD 5/22.

N. J., Hurdstown—SCHOOL—Bd. Educ., Jefferson Twp., regional school for Twp. communities, $350,000.

N. J., Riverside—SCHOOL—Bd. Educ., plans by David E. Connor, 252 S. 17th St., Philadelphia, Pa., elementary school, Washington Ave., $344,000, McCormick Taylor Assocs., 123 S. Broad St., Philadelphia, Pa., consult. engrs.

N. M., Grants—SCHOOL—Grant School Dist., Grants, elementary school, $375,000; high school unit, $625,000. CD 5/4.

N. Y., Bayshore—SCHOOL—Town, Bd. of Educ., Bayshore, plans by Eggers & Higgins, 100 E. 42 St., New York, Zone 17, Gardiner Manor School. $600,000.

▲ **O., Akron**—HOSPITAL—State Dpt. P. Wks., Ohio Dpts. Bldg., Columbus, plans by Firestone & Motter, 1412 Cleveland Ave., Canton, state hospital for mentally disturbed children, Dunham Rd. in Sagmore Twp., $1,700,000. CD 10/10, under Dpt. Mental Hygiene.

▲ **O., Akron**—JUVENILE COURT—Summit Co. Comrs., Court House, Akron, plans by Huff, Cunningham & Assoc., 1050 N. Main St., Akron, Juvenile Court, Detention Home, $1,500,000.

▲ **O., Elyria** — COURT HOUSE — Lorain Co. Comrs., Court House, Elyria, bond election Nov. 5, court house, between Lorain and Elyria, $4,500,000.

▲ **Tex., Austin**—EMPLOYMENT COMMISSION HEADQUARTERS—Texas State Bd. of Control, c/o Administration Bldg., Texas Employment Commission headquarters, $3,150,000; state insurance bd. bldg., $3,500,000; remodeling present land office and bldg. for State Bldg. Comn., $454,460.

Tex., College Station—DORMITORY—A & M College of Texas, College Station, dormitory, for John Tarleton State College, Stephenville, $550,000.

Tex., Corpus Christi—SCHOOL—Corpus Christi Independent School Dist., plans by Donnelly & Whittet, 2220 Morgan St., Corpus Christi, Tex., archt., Wynne Seale Junior High School addns., $750,000. CD 5/1/53.

Tex., Crane—COURTHOUSE, etc.—City, and Crane Co., bond election June 22, remodel courthouse and joint jail, $370,000.

▲ **Tex., Houston**—HOSPITAL—Bd. for Texas Hospitals and Special Schools, 4405 Lamar Blvd., Austin, plans by Walter C. Moore, 4405 Lamar Blvd., Austin, Tex., co-ordinating archt., 599-bed hospital, $5,000,000.

Tex., Irving—CLASSROOMS—Irving Independent School Dist., voted bonds June 8, group of classrooms, $600,000. CD 9/15/55.

Wash., Mountlake Terrace—SCHOOL—Edmonds School Dist. 15, Edmonds, plans by R. Burkhard, 2121 S.W. 152 St., Seattle, elementary school on Melody Hill, $500,000.

Wash., Shelton—SCHOOL—School Dist. 309, Mountain View Elementary School, $363,139.

N. S., Canning—SCHOOL—Municipality of Chester, high school, $600,000.

Ont., Guelph—COURT HOUSE—Wellington Co., Court House, plans by Huget, Secord & Pagani, 299 Main St. E., Hamilton, court house, $500,000.

Ont., London—HOME ADDN.—London City Council, Ray Dennis, Mayor, plans by Douglas V. Grayson, City Hall, London, 100 bed, brick and steel London Home for the Aged addn., $500,000.

▲ **Ont., Ottawa**—PARLIAMENT—Dpt. P. Wks., Hunter Bldg., plans by Mathers & Haldenby, 15 St. Mary St., Toronto, West Block expansion without radical change of present Centre, East Parliament bldgs., $6,500,000. CD 11/30/55.

COMMERCIAL BUILDINGS

▲ **Ariz., Phoenix**—HOTEL—Sands Hotel Co., 3320 E. Van Buren St., 3 story 168-unit apartment hotel, $1,500,000.

▲ **Calif., Palos Verdes**—COLLEGE—Marymount College, c/o Montgomery & Mullay, archts., 1109 Vermont Ave., Los Angeles, 12 college buildings. $5,000,000. To go ahead in 1958.

Conn., Bridgeport—CHURCH HALL, etc.—First Hungarian Reformed Church, 227 Pine St., Bridgeport, plans by Peter P. Petrofsky, 177 State St., Bridgeport, church hall and parsonage, Clinton Ave. $350,000.

Conn., Rockville—SHOPPING CENTER—Abner Rosenberg, Inwood Rd., Woodbridge, shopping center, city Hall and parking area, Peerless Mills Property. $500,000. City of Rockville, Lessee for city offices.

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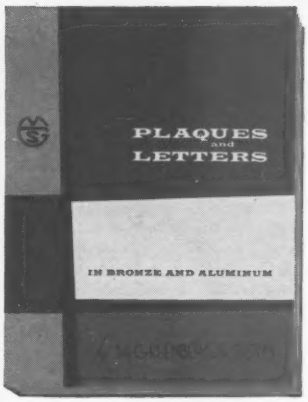

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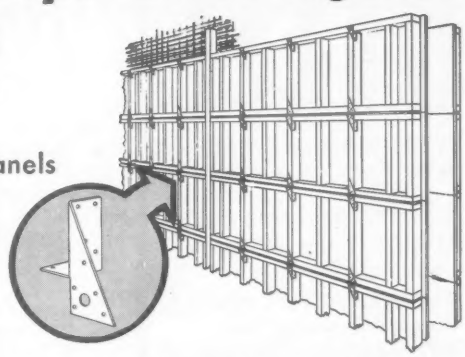

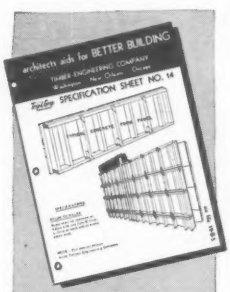

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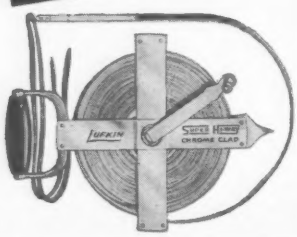

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▲ O., North Canton—HOUSING—Gene Stenger, Realtors, 3015 Brookway St., N. W., Canton, housing, in Town and Country Estates northwestern section of Plain Twp., $6,000,000.

▲ O., Twinsburg—HOMES—Wargo Realty Co., 9219 Miles St., Cleveland, Shepard Hills homes project in Macedonia Twp., ½ mi. north of Rte. 82, west of Shepard Rd., private sewer sys., $3,000,000.

▲ Okla., Tulsa — OFFICE BLDG. — Amerada Petroleum Corp., Beach Bldg., plans by Blacky West, Tri State Bldg., Tulsa, archt., 8 story office bldg. 16th and Dever Sts. $1,000,000.

R. I., Warwick—SCHOOLS—Rev. Russell J. McVinney, DD Bishop of Providence, Chancery Office, Aenner St., Providence, two high schools one for boys and one for girls. $350,000 each.

Tex., Austin—SHOPPING CENTER—Westgate Development Co., c/o W. T. Morgan and A. B. Hatley, Stafford Dr., plans by Roger L. Erickson, 107-8 Boim Bldg., Austin, 17-20 store spaces, 40,000 sq. ft. shopping center, off Bee Caves Rd., $400,000.

Tex., Fort Worth—CHURCH—Southside Church of Christ, c/o Eldred Stephens, Minister, 922 W. Leuda St., plans by Charles E. Armstrong, 1013½ University Dr., Fort Worth, church, Hemphill and Hawthorne Sts., $450,000.

▲ Tex., Houston—BOWLING ALLEYS—Syndicate, c/o Robbins and Co., Investments, 4307 Montrose St., bowling alley, for negroes 5th Ward area, $375,000; bowling alley 3rd Ward area, $350,000; bowling alley, $350,000.

▲ Tex., Houston—DWELLINGS—Krist Hubert, 5107 Jackwood St., developer, constr. approx. 700 dwellings in area Willow Meadows subdivision. $17,500,000.

Tex., Port Neches—OFFICE—United States Chemical Co., Port Neches office, $450,000.

Tex., San Antonio—SHOPPING CENTER—Geo. Delevan, Jr. and Roy Baines, c/o Phillip Lloyd Shoop, archt., 122 W. Olmos Dr., San Antonio, Unit D of North Towne Plaza Shopping Center, $450,000.

▲ Vt., Whitingham—MONASTERY—Carthusian Foundation of America, Whitingham. Plans by T. Cranston Albro III, 4 Court Square, Greenfield, Mass., 751 x 883 ft., stone monastery. $4,000,000-$5,000,000.

▲ W. Va., Wheeling—DORMITORIES—Wheeling College, Wheeling, 2 dormitories, $1,100,000.

Wis., Milwaukee—HOSPITAL—Capitol Hospital, 1971 W. Capitol Dr., plans by Francis S. Gurda, 1015 W. Mitchell St., 4 story addn. and remodel of hospital. $600,000.

▲ Ont., Kitchener—HOSPITAL—St. Mary's Hospital, Queensmount Crescent, addn. to hospital, Queensmount Cres. $3,000,000.

Ont., Kitchener—OFFICE AND STORE—National Leaseholds Corp., 6 Adelaide St. E., Toronto, Ont., plans by Bregman & Hamann, 7 Adelaide St. E., Toronto, office and store bldg., site of former Windsor Hotel, $750,000.

Ont., Toronto—PARISH HALL—Anglican Church of Canada, Toronto Diocese, 135 Adelaide St. E., enlarging and renovating St. James' Cathedral Parish Hall, $800,000.

▲ Ont., Trenton—SHOPPING CENTER—Principal Investments, Ltd., 133 Richmond St. W., Toronto, Trenton Shopping Center, Sidney Twp., $1,500,000.

▲ Que., Montreal—HOUSING—Broadway Construction Co. Ltd., 282 Ontario St. W., Montreal, plans by Gabriel Jarry, 12385 Jeanne Mance St., Montreal, 200-unit housing program, new streets L'Abord A Plouffe. $3,000,000.

INDUSTRIAL BUILDINGS

▲ Calif., Richmond—PLANT—Standard Oil Co. of Calif., 30 Rockefeller Plaza, New York 20, N. Y., paraxylene plant adjacent to existing plant at Richmond Refinery, to produce 25,000,000 lbs. a year. $3,000,000. To be completed 1958.

Calif., San Leandro—TERMINAL BLDG.—Burns, Bear, McNeil & Schneider, c/o T. A. Thomas, archt., 1444 Webster St., Oakland, 11,000 sq. ft., rein. con. constr. terminal bldgs., with 40,000 sq. ft. dock, 12,000 sq. ft. shops, 11,000 sq. ft. office, $750,000. 6/27/57.

Conn., Hartford—WAREHOUSE—Suisman & Blumenthal, Inc., 79 Willow St., 150,000 sq. ft. warehouse, Locust St., South Meadows, $900,000.

▲ Ind., Fort Wayne—OFFICE—Lincoln National Life Insurance Co., Brackenridge St., plans by Holabird, Root & Burgee,, 180 N. Wabash St., Chicago, Ill., 6-story, with bsmnt., 159x263 ft. office addn. and 9-story, 64x142 ft. tower adjoining 6-story section, bounded by Calhoun St., Douglas Ave. and Brackenridge St., $1,000,000.

Iowa, Sioux City—PLANT—Sioux City Dressed Pork, Inc., Stock Exchange Bldg., stock yard packing plant, $900,000. 6/27/57.

▲ N. J., Morristown—PLANT—Dairypak, 230 Park Ave., New York, N. Y., plant for manufacture of plastics. 24-acre tract on Hanover Ave., $1,000,000.

▲ N. C., Wilmington—PLANT—Allied-Kennecott Titanium Corp., 61 Broadway, New York, Zone 6, N. Y., plant to product titanium forgings and billets on 1,500 acre site, 7 mi. south of here on Cape Fear River, $30,000,000. T. J. Kauffeld Assocs. Inc., 1 S. Broadway, New York, Zone 7, consult. engr. Semet-Solvay Eng. Div., 40 Rector St., New York, Zone 6, owners' engr.

Conn., Trumbull—HOUSES—Anthony J. Calandro, 1736 Boston Ave., Bridgeport, 65 houses, "Peter's Hollow", Daniels Farm Rd. $650,000.

Ind., Muncie—OFFICE—Indiana Steel & Wire Co., Inc., 700 S. Council St., plans by McGuire & Shook, 1400 Fletcher Trust Bldg., Indianapolis, 2 story, 62x122 ft., rein.-con., steel frame, office bldg. $350,000. Rotz Eng. Co., 1919 N. Meridan St., Indianapolis, consult. engr.

Iowa, Council Bluffs—BOWLING ALLEY—Playland Park Amusement Park, 4040 W. Broadway, 24-alley bowling bldg. at park. $350,000.

▲ Ky., Louisville—HOTEL—Jack Cooper, Seymour Richie, Morris Landberg, 618 N.E. 124th St., North Miami, Fla., 4 story, indoor and outdoor swimming pools, hotel, near Lees Terminal Air Port and Ky. State Fair Grounds and Exposition center. $3,750,000.

Me., Biddeford—SHOPPING CENTER—Richard Sampson c/o King Woodman, Real Estate Agency, 260 Main St., 12 store shopping center, Five Points Section Rte. No. 1, Approx. $350,000.

Me., Portland—SHOPPING CENTER—Arthur A. Serunian c/o Serunian's Market, 207 Danforth St., 23 acre shopping center, car parking lot, "Mayfair Plaza", Routes 1 & 88, Approx. $400,000.

▲ Md., Takoma Park—SHOPPING CENTER—Greenbelt Consumers Services Inc., Greenbelt, plans by McGaughan & Johnson, 2000 P St. N. W., Wash., D. C., shopping center at New Hampshire Ave. & East-West Hy., $1,500,000.

▲ Mass., Lexington—HOTEL—The Hotel Corporation of America, c/o Roger P. Sonnabend, 46 Malia Terrace, Newton, motor hotel incl. swimming pool, Junction Rtes. No. 2 and 128, Charterhouse Minuteman, $1,000,000.

Mass., Springfield—STUDENT CENTER, etc.—Springfield College, 263 Alden St., plans by Alderman & MacNeish, 594 Riverdale St., West Springfield, student center. $400,000; and boy's dormitory. $350,000.

▲ Mo., St. Louis—HOSPITAL—Christian Hospital, 4400 N. Newstead Ave., St. Louis, Zone 15, plans by Syl. G. Schmidt & Assocs., Railway Exchange Bldg., 611 Olive St., Zone 1, 7 story hospital addn., $2,000,000. CD 4/17/56.

N. J., Lodi—HOUSING—Lodi Housing Auth., Lawrence Ave., plans by John Baldino, County Bank Bldg., Passaic, 60-unit housing authority for 4th district $500,000.

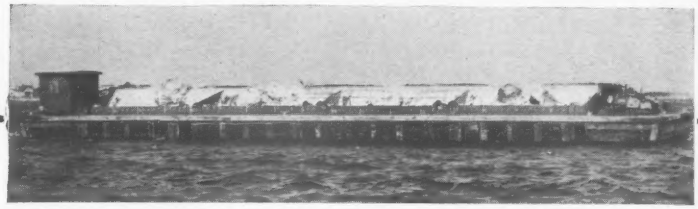
▲ O., Dayton—SHOPPING CENTER—Esdaneff Realty Inc., c/o Sol Friedman, 4247 Catalpa St., 1 story, brick, shopping center, 10-acre site along N. Main St. near Philadelphia Dr., $1,500,000.

FOR SALE

SIDE DUMP SCOW

250 cubic yard capacity

LENGTH—110' WIDTH—30' DEPTH—9'4"



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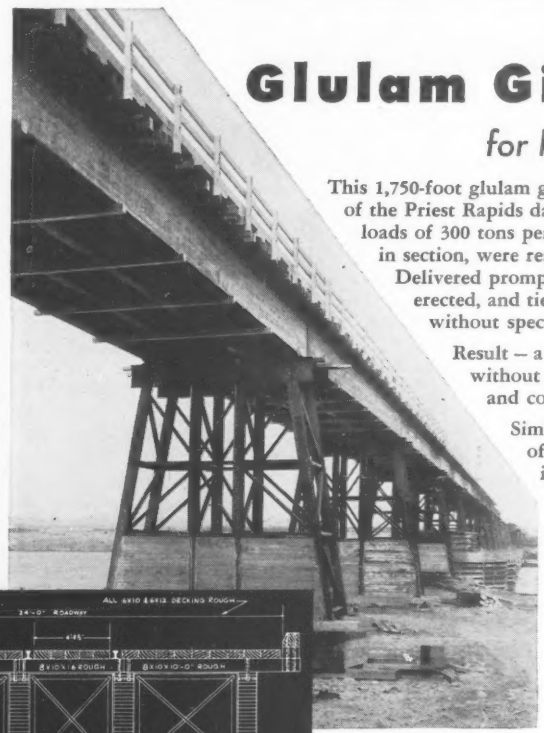
Glulam Girder Bridges

for heavy loadings and low cost

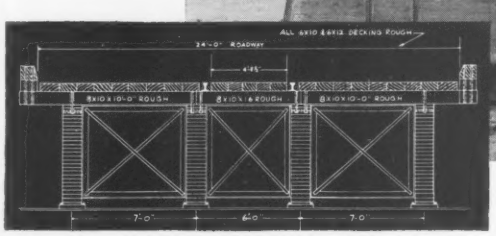


Bridge of 100-foot spans is 24' wide between wheel guards. It is designed to carry two Euclid trucks or a diesel locomotive and car in each span. 8"x10" ties were doweled to the girders, over which a 6" decking was laid. Design by Joe Peraino, chief engineer, construction department of Merritt-Chapman & Scott Corporation, New York City.

This 1,750-foot glulam girder bridge, built to speed construction of the Priest Rapids dam, is designed to carry maximum loads of 300 tons per span. Glulam girders, 12¾" x 63⅜" in section, were readily available at favorable cost. Delivered promptly to the jobsite, they were quickly erected, and ties and decking were put in place without special equipment or crews.

Result – a thoroughly adequate bridge, erected without waiting for hard-to-get material, and completed at low cost.

Similar results are obtained with other designs of engineered timber bridges which are illustrated in the booklet "Timber Bridges". Get your copy from your Timber Structures representative, or write us for it.



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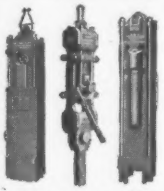
PILE HAMMERS AND EXTRACTORS



Now made in complete standardized line of 11 double-acting hammers, 5 single-acting hammers and 2 double-acting extractors. Also Sand Drain Equipment and Steam Generators.

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32 Mercer Street, Dover, N. J.

▲ **O., Delaware**—PLANT ADDN.—American Brake Shoe Co., Engineering Div., 1160 Dublin Rd., Columbus, 24,000 sq. ft. plant addn. at Delaware wks., **$1,300,000.**

R. I., Coventry—PIGMENT BLDG.—Hoescht Chemical Co., c/o Lamborghini & Christoph, 110 Main St., East Greenwich, R. I., archt., 2 stories, 128x73 ft., pigment bldg., **$130,000;** bids in July. 6/27/57.

▲ **Tex., Houston**—HARDWARE STORE—Bering-Cortes Hardware Co., Milam at Prairie Sts., retailing and wholesaling hardware store plant, incl. warehousing, loading platform, storage, off Washington Blvd., **$1,000,000.**

▲ **Tex., Houston**—LABORATORY—Humble Oil & Refining Co., 1216 Main St., plans by Mackie & Kamrath, 2713 Ferndale St., Houston, 100,000 sq. ft. existing laboratory addn., 2130 Buffalo Speedway, **$4,000,000;** Bernard Johnson & Assocs., 4926 Travis St. and Walter P. Moore, 2 Pinedale St., Houston, consult. engrs.

UNCLASSIFIED

Ala., Phil Campbell—GAS SYSTEM—Town, Town Hall, natural gas sys. for town area between Bear Creek and town, **$150,000;** Polk, Powell & Hendon, 621 Stallings Bldg., Birmingham 3, Ala., consult. engrs. CD 5/27.

▲ **Calif., Los Angeles**—PARK—City, City Hall, voted bonds May 28, park sys. expansion, **$39,500,000.** CD 3/13.

▲† **Calif., San Francisco**—LABORATORY—Twelfth Naval Dist., P. Wks. Office, San Bruno, plans by Ralph M. Parsons Co. & Von Storch & Burkavage, 617 S. Olive St., Los Angeles, addnl. facilities, U. S. Naval Radiological Defense Laboratory. **$2,500,000.**

▲ **Calif., San Jose**—PARKS—City, City Hall, voted bonds June 11, parks and community center **$2,500,000.** CD 10/16/44.

Calif., Woodside—TENNIS COURTS, etc.—City, 231 Arbor Lane, San Mateo, four tennis courts, swimming pool and clubhouse, **$140,000.**

▲ **Colorado**—RURAL DISTRIBUTION LINES—Highline Electric Assoc., Holyoke, 103 mi. rural distr. lines, 9 mi. 115-kv transmission line, 20 mi. 69-kv transmission line and sys. imprvs., Phillips Co., **$1,520,000.**

Indiana—RURAL DISTRIBUTION LINES—County Rural Electric Membership Corp., Sullivan, 35 mi. rural distr. lines and sys. imprvs., Sullivan Co., **$440,000.** CD 6/27/54.

Iowa—RURAL DISTRIBUTION LINES—Buena Vista County Rural Electric Co-operative, Storm Lake, 1 mi. rural distr. line sys. imprvs., Buena Vista Co., **$238,000.**

Iowa—RURAL DISTRIBUTION LINES—D. E. K. Rural Electric Co-operative, Estherville, 4 mi. rural distr. line and sys. imprvs., Emmet and Dickinson Counties, **$264,000.** CD 1/19/49.

Iowa—TELEPHONE SYSTEM—Lone Rock Co-operative Telephone Co., Don Houck, mgr., Lone Rock, rural telephone sys. imprvs. extens., Proj. Iowa 562A, Kossuth Co., **$136,000.** DeWild & Grant Eng. Co., Rex Rogers, Engineer, Rock Rapids, Iowa, consult. engr. CD 5/1.

▲ **MASSACHUSETTS**—RECREATIONAL DEVELOPMENT—Commonwealth of Mass., MDC. Constr. Div., 20 Somerset St., Boston, recreational development and flood control, Needham, West Roxbury and Brooklin, and Dedham, **$1,500,000.**

Mass., Worcester—ARMORY—Commonwealth of Mass., Military Dpt., 905 Commonwealth Ave., Boston, armory, **$480,000.** Late 1957 constr.

Mississippi—RURAL DISTRIBUTION LINES—Magnolia Electric Power Assoc., McComb, 72 mi. electric distr. line and sys. imprvs., Pike Co., **$708,000.** CD 9/22/54.

Mo., Kirkwood (St. Louis 22, P.O.)—ELECTRICAL SYS.—City, William C. Mason, clk., City Hall, voted **$315,000** bonds June 4, electrical sys. exten.; defeated **$108,000** bonds June 4, modern st. lighting facilities for Manchester and Kirkwood Rds. CD 5/17.

N. H., Hanover—PARKING LOT—Town, Gordon Glidden, Precinct Comm., Precinct Bldg., 180-car parking lot, Main and West South Sts. **$175,000.**

N. H., Keene—PARKING LOT—City, c/o Donald E. Chick, city mgr., City Hall, parking lot, Railroad Square, **$300,000.**

N. J., Springfield—RIDING STABLE—Bd. Chosen Freeholders, Union Co. Court House, Elizabeth, plans by McMurray Assocs., 983 Stuyvesant Ave., Union, 30x212 with extension 30x41 ft. stable for riding academy at Upper Mountain, **$100,000,** CD 5/8.

▲ **N. Y., Rockaway Beach**—SHORE PROTECTION—Dpt. of Parks, Arsenal Bldg., New York, Zone 21, Proj. P-379, shore protection of Rockaway Beach $1,800,000. To go ahead in 1957.

Texas—GASOLINE PLANT, etc.—El Paso Natural Gas Co., c/o El Paso Natural Gas Bldg., El Paso, gasoline plant expansion to process high liquid content gas, near Rankin, **$2,000,000;** 38 mi. various diam. gas pipe lines in Rankin, Upton Co., **$425,000.**

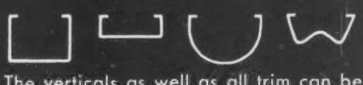
Wash., Seattle—LOADING PLATFORM—Port of Seattle, Bell St. Terminal, loading platform at Pier 43. $100,000. Marshall, Barr & Assocs., Lloyd Bldg., Zone 1, consult. engrs. CD 3/13/47.

Complete design Versatility with standard components

windows

Specify any size or type your design requires. Glass can be clear or patterned, and single or double glazed. Sash can be either fixed or operating in awning, projected, pivoted and hopper types or Robertson's new V-Window (hinged for inside cleaning).

verticals



The verticals as well as all trim can be fabricated from a variety of materials to provide contrast with the spandrels. The vertical members can be fabricated in a number of cross-sections to suit your design requirement.

spandrels

Here again, an infinite number of design and size selections are possible. The V-Panels can have a wide variety of surface patterns and be fabricated in aluminum, bronze, stainless steel, Galbestos or vitreous enameled aluminum or steel. Versatile Wall offers complete freedom of design.

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Pioneers in puttyless glazing since 1915

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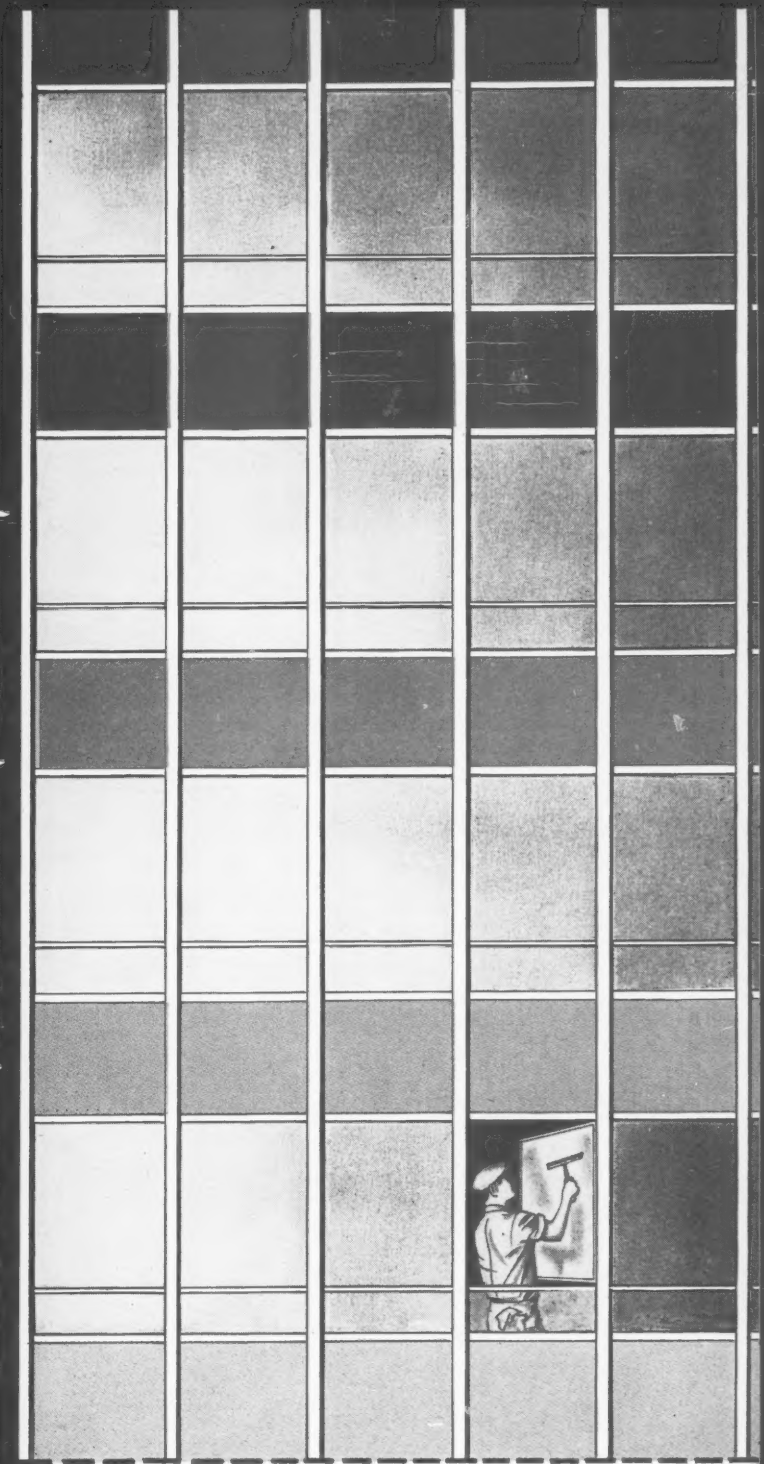

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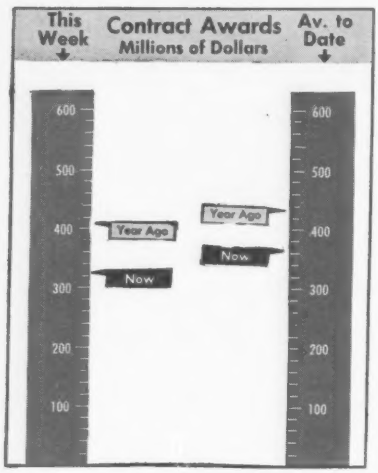
Construction Scoreboard

Activity this Week



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 26 wks 1957	Chge '56-'57 %
	millions		
Federal	$38.7	$1,381.9	+54
State and Municipal	155.2	3,651.0	+12
Total Public	193.9	5,032.9	+21
Total Private	136.2	4,412.6	−39
U. S. Total	$330.1	9,445.5	−17
By Type of Work			
Waterworks	$9.3	$200.6	+27
Sewerage	10.5	258.5	−16
Bridges	18.8	367.5	+15
Highways	68.9	1,521.5	+29
Earthwork, Waterways	14.3	589.3	+37
Buildings:			
Public, Excl. Housg.	45.6	1,105.8	+9
Public Housing	9.1	354.3	+101
Private Housing	47.0	1,562.6	−48
Commercial	46.5	882.4	−8
Industrial	41.5	1,733.4	−39
Unclassified	18.6	869.6	−9
U. S. Total	$330.1	$9,445.5	−17

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

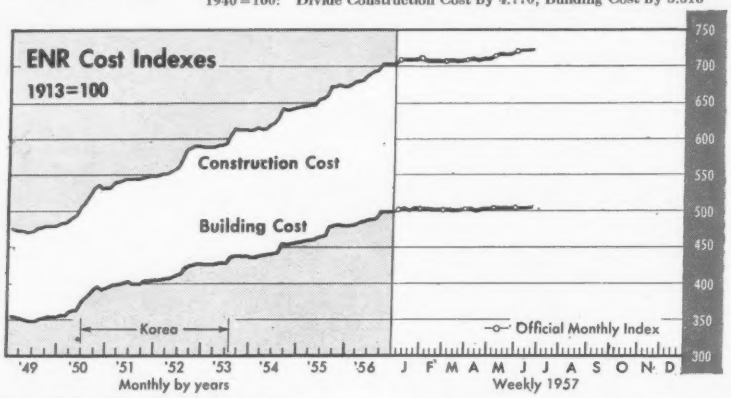
NEW CAPITAL FOR CONSTRUCTION

	Week of June 20	Cum. 25 wks 1957	Chge '56-'57 %
	millions		
Corporate Securities	$119.8	$3,041.2	+43
State and Municipal:			
All Except Housing	109.3	2,751.0	+20
Housing	47.0	90.5	+120
Federal Loans	5.5	113.6	+45
Federal Aid	...	1,965.0	+117
Total Nonfederal	$283.6	$7,961.3	+46
Federal Appropriations:			
In U. S.	...	$27.7	−64
Outside U. S.	...	13.0	...
Total New Capital	$283.6	$8,002.0	+45

Cost Indexes as of Now

ENR INDEXES (1913=100), 20-cities' average	Week of June 20 1957	% Change from May 23 1957	% Change from June 21 1956
Construction Cost	724.04	+0.8	+4.5
Building Cost	506.17	+0.5	+3.6

To convert above indexes to 1926=100: Divide Construction Cost by 2.080; Building Cost by 1.850
1940=100: Divide Construction Cost by 4.770; Building Cost by 3.518



BACKLOG OF PROPOSED HEAVY CONSTRUCTION

	May 31 1957 (millions)	Percent Change from last Month	Year
Total U. S. (ENR reported)	$106,416	+0.3	+6.5
By Ownership—			
Private	45,155	+0.5	+5.8
State and Municipal	47,900	+0.4	+8.1
Federal	13,361	−0.5	+3.1
By Type of Work—			
Waterworks	2,277	+0.5	+9.9
Sewerage	3,310	+0.7	+9.4
Bridges	3,065	+0.5	+7.9
Highways	12,855	−0.3	+9.9
Earthwork, Waterways	11,166	−0.5	−1.2
Public Buildings	19,503	+0.9	+10.0
Industrial Buildings	16,427	−0.2	+2.7
Commercial Buildings	19,275	+0.7	+11.9
Unclassified, Private	9,452*	+1.0	−0.01
Unclassified, Public	9,086	−0.2	+5.6

*Includes private bridges, $88 million

FLOW OF NEW PROJECTS INTO THE BACKLOG

	1957 May (millions)	1957 5-months (millions)	Percent Change from '56 May	Year Cum.
Total U. S. (ENR reported)	$1,441	$8,636	−41.4	−30.7
By Ownership—				
Private	690	4,477	−55.6	−33.1
State and Municipal	665	3,675	−16.2	−26.4
Federal	86	484	−22.8	−37.9
By Type of Work—				
Waterworks	81	208	−66.3	+24.9
Sewerage	64	278	+36.2	+37.1
Bridges (public)	25	203	− 8.7	− 9.9
Highways	137	1,210	−56.3	+73.2
Earthwork, Waterways	2	68	−62.4	−82.3
Public Buildings	376	1,862	−15.8	−21.5
Industrial Buildings	190	1,646	−75.9	−48.1
Commercial: Mass Housing	148	1,129	−56.2	−32.9
Other Building	247	1,301	−19.9	+ 4.6
Unclassified, Private*	105	401	−12.5	−30.9
Unclassified, Public	66	330	+60.0	−80.8

*Includes private bridges

FLOW OF PROJECTS OUT OF BACKLOG INTO CONTRACTS

Total U. S. (ENR reported)	938	4,059	− 2.7	− 4.4
By Ownership—				
Private	352	1,558	−27.1	−32.9
State and Municipal	449	1,845	+20.2	+24.3
Federal	138	656	+27.5	+49.0

The NEW JACKSON VIBRATORY COMPACTOR

HAS MUCH MORE POWER and SPEED . . . UNMATCHED ADAPTABILITY TO JOBS OF ALL TYPES!

Here's the machine that will give you maximum density of all materials normally used in macadam base courses and sub-bases with the greatest economy and convenience.

It's a vastly improved version of the Jackson Multiple Compactor which was used with great success on virtually all the nation's important paving projects. It is much more powerful and faster, providing time-saving, full course, single pass compaction. And unmatched as it is for quick and easy adaptability to jobs of all types, it will handle each of them with greatest convenience and least lost motion. Moreover, with this machine you can get into places others can't touch. By all means see your nearby Jackson Distributor (name on request) about this machine or write to us for the complete facts before buying any compactor.

ANY ARRANGEMENT DESIRED OF VIBRATORY UNITS IN THE WORKHEAD TO FIT THE JOB MOST ADVANTAGEOUSLY IS QUICKLY AND EASILY ACHIEVED.

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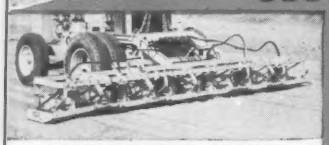
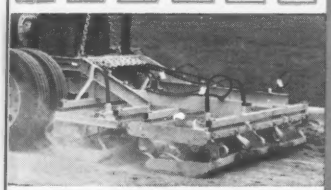
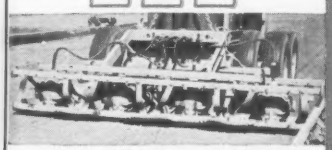


6 UNITS ABREAST FOR MAXIMUM COVERAGE

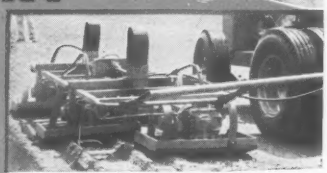


6 UNITS IN TANDEM FOR MAXIMUM ONE PASS CONSOLIDATION



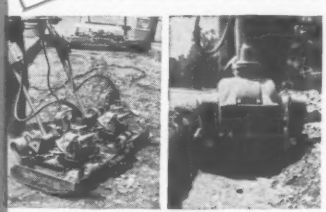
4 UNITS (or it might be 5) TO EXACTLY FIT JOB WIDTH REQUIREMENTS

5 UNITS IN TANDEM AND STAGGERED. VARIABLE FOR A WIDE RANGE OF WIDTHS.

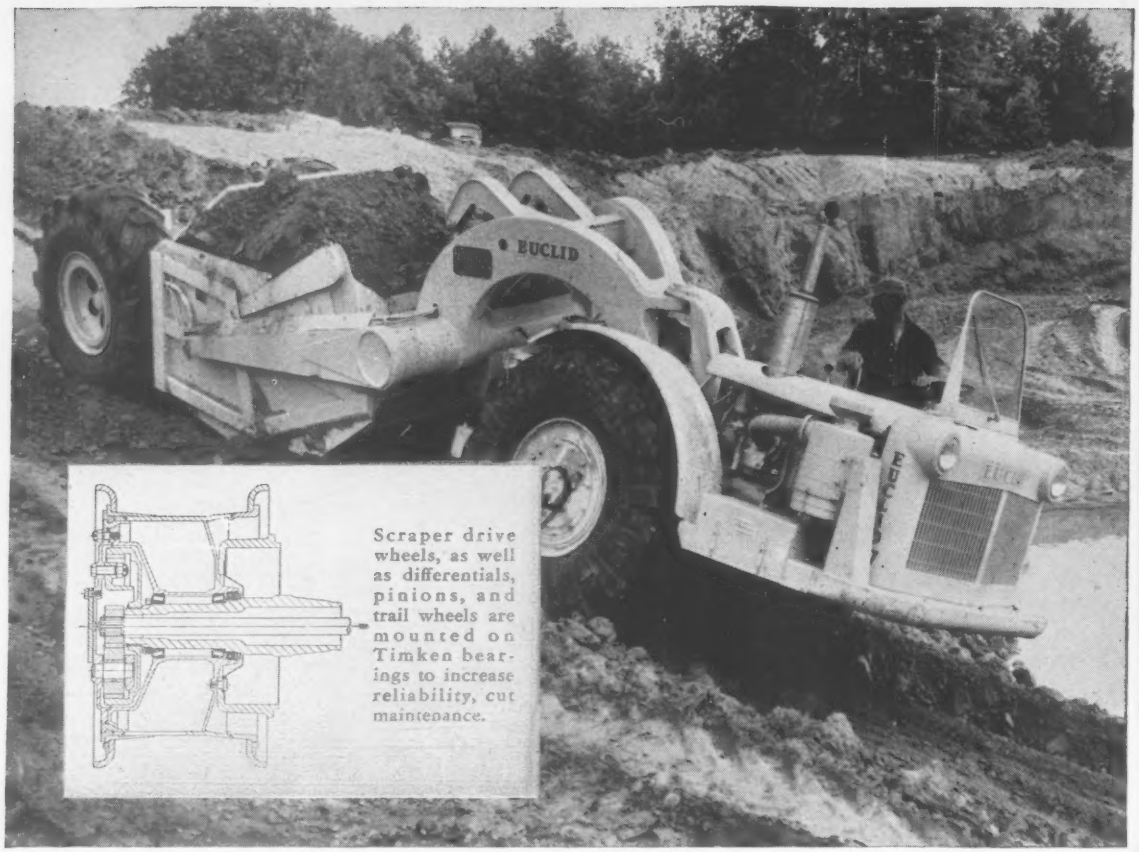


4 UNITS TOWED AT SIDE OF TRACTOR. IDEAL FOR ONE PASS WIDENING OPERATIONS.

SHOULDER COMPACTION IS AUTOMATIC. End unit automatically assumes this position — no adjustment required. Prevents raveling.



AND FOR SPOTS OTHERS CAN'T REACH. Any of the compacting units in the Jackson Vibratory Compactor workhead can be fitted with operating handle and used exactly like the nationally renowned Jackson Manually Guided Compactors. Perfect for getting into odd spaces and close to walls, etc. — spots that can't be reached by other equipment. One man with a twin hookup of two of these units will compact up to 1,200 sq. yds. of granular soils in 6" layers per hour.



Scraper drive wheels, as well as differentials, pinions, and trail wheels are mounted on Timken bearings to increase reliability, cut maintenance.

Laughs at tough scrapes... with TIMKEN® bearings to roll the load

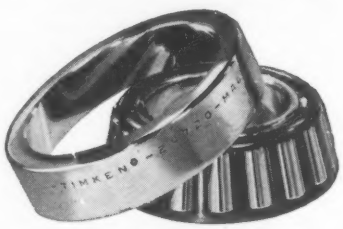
SCRAPERS are well known for their rugged dependability. How do they get that way? One big factor is Timken® tapered roller bearings. Pictured above is a typical overhung scraper taking a load over a stiff slope. In wheels, pinions, and differentials, you'll find Timken bearings in scrapers up to 518 horsepower and 24 yards capacity.

Timken bearings are first choice with makers of earth moving equipment because they supply the dependability that keeps machines on the go. Their tapered construction permits them to take radial and thrust loads or any combination. They practically eliminate friction, making heavy loads easier to move. Timken bearings are geometrically designed to give true rolling motion—precision-manufactured to live up to their design.

Timken bearings keep shafts and housings concentric to maintain positive closures. Dirt stays out, lubricant stays in to insure longer life, keep breakdowns to a minimum. Case-carburizing of Timken bearings gives them hard, wear-resistant surfaces over tough, shock-resistant cores. That's one big reason Timken bearings normally last the life of the machine.

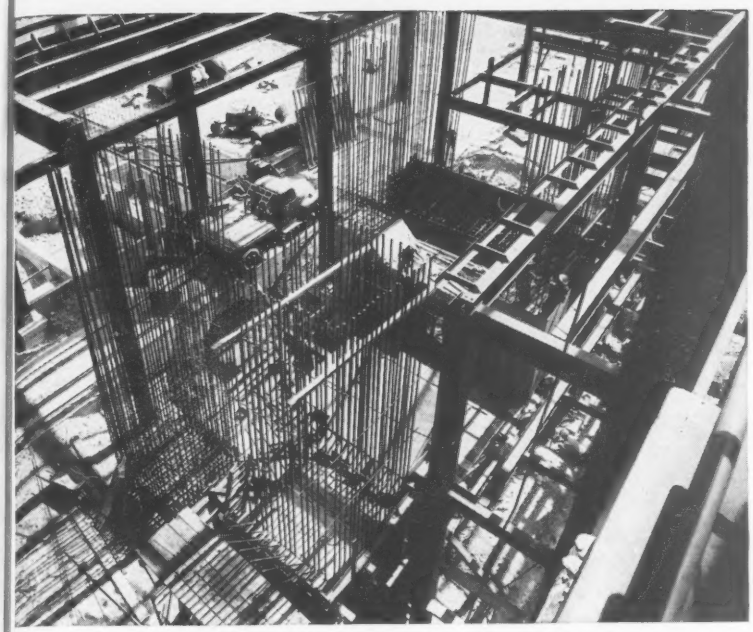
We even make our own steel to make sure it's the best. No other American bearing manufacturer does. Make sure you get all these advantages in the machines you build or buy. Always specify Timken tapered roller bearings. Look for the trademark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



TIMKEN

TAPERED ROLLER BEARINGS ROLL THE LOAD



• W. B. Tuttle Plant, Unit #2 — 100,000 kw power plant for City Public Service Board of San Antonio is one of H. B. Zachry's latest projects. It is part of approximately $25,000,000 worth of work completed by Zachry in 1956.

"CONSTRUCTION DAILY HELPS US KEEP 2000 MEN, 1500 PIECES OF EQUIPMENT BUSY YEAR-ROUND",

Says H. B. Zachry Co.

"We complete approximately $100,000 worth of construction each working day," says J. D. Lang, Assistant to the President of H. B. Zachry Co., general contractors of San Antonio, Texas. "To maintain this level of operation, and keep our 1500 pieces of major equipment and 2000 men busy, we have to be continually on the lookout for major new contracts. Construction Daily is our best source of advance information on new work of sizeable proportions."

"The Daily Reports and Newsletter are received by airmail. They are routed first to Mr. H. S. Kerr, Vice President. He studies them and notes any jobs that we may be interested in bidding. He then may discuss these with our president. They also discuss any significant trends in materials, equipment or labor prices, and any noteworthy changes in business conditions reported in the Newsletter. It is then referred to me for general business background and, in particular, for announcements of any new developments in the planning stage," reports Mr. Lang. "We also use the Daily for economic indicators for future planning purposes. Price report information on significant changes in lumber, cement and reinforcing steel are brought to the attention of our estimators."

The Construction Daily can help you build business, too. Published every working day of the year, it includes two separate publications — the Daily Newsletter and the Construction Reports. The Newsletter is two quick pages of highspot news, newly announced bid dates, proposed new work reports, price information, economic news, reports from Washington and other fast-breaking news that keeps you a step ahead of your industry. The Reports section includes bids asked, low bids, and contract awards on more than $80,000,000 worth of business every day. It is the fastest, most complete system of reports on heavy construction in the country.

Construction Daily can arrive on your desk every morning, delivered air mail west of the Mississippi, giving you a big jump on new business and changes in business conditions that will pay off in new contracts, and time and money saved on current projects. A full year's subscription to this specialized news service costs only $175. Quarterly subscriptions are available for $50 for three months. Write now for complete details.

About H. B. Zachry Co. . . .

Founded in 1925, H. B. Zachry Co. started business as a highway contracting firm exclusively. Gradually they expanded into small commercial and public structures until 1938 when a large natural gasoline plant contract marked its entry into the major industrial field.

The war years were marked with explosive growth, with the firm building airfields, cantonments, and other military facilities in Texas. After the war the company expanded into construction of pipelines, petro-chemical plants, power plants, railroads and dams. Sixteen wholly-owned subsidiaries and affiliated companies have been created in fields ranging from insurance and mortgage companies to contract flight training, aircraft distributorships and aircraft refueling.

In 1940, Mr. Zachry, the founder, served as national president of the Associated General Contractors of America.

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ONLY YOUR International distributor *can make this deal:*

Buy your job-sized 4-In-1 on tracks or rubber from a complete line of profit-producing rigs.

Now—why tie-up useful money or "strap" your credit by "over-equipping"? Why spend upwards of four times as much for several limited-duty machines which one 4-In-1 can replace—and outproduce?

An International Drott 4-In-1 gives you 4-machine usefulness for one moderate investment. Yes, the exclusive and revolutionary 4-In-1 gives you instant availability of 4 big-capacity machine actions!

You get world-beating Skid-Shovel excavating-

All-in-1 International Drott 4-In-1

"Carry-type scraper"

with "see-easiness" of front-mounting—to *grade, strip, spread, or compact* with amazing, inch-close accuracy!

Skid-Shovel...

with Drott's exclusive, "concrete-smashing," triple-power pry-action break-out—and 42° ground-level bucket roll-back!

machine job-capacity
One-machine price!

oading performance. You get exclusive multi-purpose carry-type scraper" action. You get production-boosting clamshell action. You get "radius-controlled" bulldozer action with big-yardage earth-rolling ability!

You get 4-In-1 versatility unlimited for a fraction of e price of the machines it can replace and outperrm, on job after profitable job!

And you can have 4-In-1 advantages teamed with l-condition International crawler traction, or rubber-tired Hough Payloader speed!

See your International Distributor—he's the only one who can offer you a 4-In-1 deal! He's the only one who can save you the thousands of dollars that 4-In-1 ownership assures—by giving 4-machine utility for one moderate investment. And he can prove the "heap of difference" in 4-In-1 performance on tracks or rubber—against anything else in the field! See him soon for a demonstration!

gives you...

Clamshell...

that "surrounds" loose materials and fills in one fast gulp—gives you "hopper-high," self-cleanout dumping action.

Bulldozer...

with clam lip up, and skid shoes on the ground, the radius-controlled blade rolls the earth with precision!

ONLY YOUR International distributor CAN OFFER THESE EXCLUSIVE FEATURES!

Here's w
job-range ca

Exclusive triple-power pry-action break-out

Inbuilt ability to deliver tremendous excavating force enables this TD-9 4-In-1 to yank out deeply embedded old masonry piers. You see typical, on-the-job advantages of true and exclusive International Drott pry-over-shoe break-out action—the only design that gives you the three absolute essentials: (1) Full hydraulic power transfer from full piston-face power-push; (2) Long lever to apply full pry-power; (3) Fixed fulcrum of frame-mounted skid-shoes, to concentrate pry-force!

Exclusive parallelogram raise action

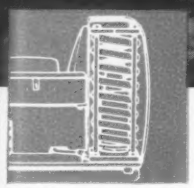
No eccentric tipping to cause spill-back and lose yardage! The 4-In-1 has non-spill, roll-back level—all the way up. Compared to ordinary front-end loader performance, this feature, alone, can increase your daily yardage up to 18%! You can bottom-dump the 4-In-1 as a clamshell...and do it 2½-foot higher than ordinary roll-forward buckets. And bottom dumping eliminates the sticky materials problem—where other rigs foul up and can't get the job done!

Check these other famous International Drott Exclusives!

- **STANDARD EQUIPMENT.** Three-valve design, to provide hydraulic control power for attachments.
- **STANDARD EQUIPMENT.** Double-bottom, bridge-truss bucket to insure 4-In-1 strength to match pry-action.
- **STANDARD EQUIPMENT.** Yoke-type supports to insure linkage strength to back 4-In-1 capacity!
- **STANDARD EQUIPMENT.** Magnetized dip stick to prevent damage to hydraulic system from minute abrasives!

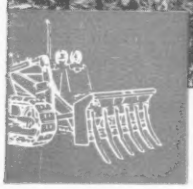
Only your International Distributor can offer you the big money-making advantages of International Drott exclusive 4-In-1 features. Only he can deliver you job versatility unlimited, in the world's only multi-purpose machine of its type! Prove to yourself that your correct size of 4-In-1 can replace and outperform a whole machinery yard full of limited-duty rigs. Ask for a demonstration!

where 4-in-1 gets world-beating capacity... stay-put performance!



Exclusive shock-swallowing Hydro-Spring

Capacity-boosting, machine-protecting Hydro-Spring is a hydraulic cylinder enclosed in a heavy-duty locomotive-type coil spring. Shock force displaces oil from main lift cylinders into the Hydro-Spring cylinder—extending it and compressing the big spring to absorb and cushion impact loads. Slamming the 4-In-1 bucket into hard material—'dozing frozen ground—dumping rock with a bang—you never worry! Hydro-Spring gentles trouble-causing forces by two-thirds or more—practically eliminates hydraulic hose failures!



Complete line of attachments

Job-getting, money-making attachments built for specialized duty, provide tree-grubbing, boulder-bucking, log-loading performance available only from International Drott equipment! Grubber Blade attachment, used in place of the 4-In-1, is shown applying the tremendous force of pry-action break-out—to uproot a tough old oak tree. Other special attachments built to extend International Drott advantages to other fields include: Rock Forks, Skid-Grapples®, Bulldozer and Bullangledozer blades!

CHOOSE FROM

four 4-in-1 sizes

TRACTOR SIZE	4-IN-1 CAPACITY
TD-6	1-YARD
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TD-14	2¼-YARD
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THE LONGER LOOK:

Economy Slows Down, Still Running Fast

The outlook for business at midyear continues good—but how good depends on where you're sitting. The over-all figures are showing small gains or no change, for the most part, but they cover up a host of plusses and minuses for individual industries and companies.

Construction is following just this sort of trend: Total dollar volume of work put in place is inching up, but public work is booming while private residential and commercial building are running well under year-ago figures.

The pace of the economy clearly has slackened since last fall. Gross national product, the total output of goods and services, was climbing at a rate of $5 billion to $10 billion a quarter in 1956. So far this year it has gone up only $3 billion per quarter.

Industrial production has even slipped a little since December. Then the Federal Reserve Board index was running 147 (1947-49 = 100); now it's only 143, barely over the year-ago figure of 141. Employment is holding close to last year's level.

One area where the trend has definitely been up is prices. Wholesale prices are now almost 3% higher than a year ago; and consumer prices are up by more than 3%.

Chances are the rest of 1957 will trace the same general pattern as the first six months, though a little extra lift can be expected in the final three months when the new auto models are in full production.

Reasons for a steady, if slow, rise in general business are:

• **Government spending** at both the federal and state-local levels will climb at an annual rate of about $1 billion a quarter. A big chunk of this increase will go for construction.

• **Consumer income** is going up at an annual rate of about $1 billion a month, and consumers are spending more—with most of the increase going to services and nondurable goods. Consumer income will get an extra boost from wage increases, which are being granted automatically to some 5 million workers this year.

• **Business spending** on new plant and equipment, while not rising at last year's seam-splitting pace, is still moving up. The latest McGraw-Hill survey indicates that capital spending will run 12% higher this year than in 1956.

• **No serious trouble spots** loom for the next few months. Business inventories generally seem to have been kept under remarkably good control, making unnecessary any sharp cutback of orders. And there are no major wage negotiations scheduled this year that could produce a crippling strike.

This is not to say that business faces no problems in keeping on the upgrade. Tight money continues to put a crimp in construction, particularly homebuilding, as demand for money presses hard on the available supply of credit. And ambitious expansion programs have boosted capacity too fast in some industries.

Here is the outlook for a few major industries through the rest of the year 1957:

Automobile production has been running slightly ahead of the 1956 pace, 3.2 million cars being turned out in the first six months. Dealers' stocks are in relatively good shape and several completely new models will come this fall from Ford and General Motors. So the year should wind up with production of about 6.2 million cars.

Steel production ran about 91% of capacity in the first six months, with some inventory build-up by consumers to beat an expected price increase. Vacation shutdowns and the drain-off of inventories will hold down the third quarter. But a strong fourth quarter with heavy auto industry demand should make the annual total 117 million tons, or 2 million more than in 1956.

Nonferrous metals have been going through a skittish period of falling prices and uncertainty over government stockpile policies. And buyers have held off—or bought only enough for current needs—in anticipation of more price cuts. Still, the fact that strikes held down last year's second-half output will help this year's total to show a gain.

Chemical output has been averaging about 4% over year-ago rates, and is likely to do the same in the second half. But this is not enough to make producers in this growth industry throw their hats in the air.

Machine tool shipments in the first half ran 7% over the last six months, and one-fifth over the first six months, of 1956. But new orders have been running below shipments. So, taking higher prices into account, this year should show a gain of about 5% in dollar volume but a slight decline in physical volume of shipments.

Electrical apparatus manufacturers are having their biggest year ever. Production is running about 8% ahead of last year's rate. Even with a drop in new orders, backlogs are so heavy that physical volume will probably top the 1956 total by 10%.

Electrical appliances, on the other hand, have made a disappointing showing. Even dishwashers, air conditioners and freezers have not enjoyed much increase in sales. One reason is the slowdown in housing completions. Rising consumer incomes will help in the second half, but the year's output still may drag about 10% below last year.

Petroleum refiners have turned out only about 2.5% more in the first half of this year than they did a year ago. The drop in homebuilding, the lack of gain in industrial production and the modest increase in auto registrations have held down the normal gain for oil products. The rest of the year should hold to about the same course.

Lumber and **construction materials** have been running behind early 1956 production rates because of the drop in physical volume of construction. With slight gains in residential, highway and school construction in the second half, construction materials may match last year's total output. Lumber should hold steady at its first-half rate.

Prices should increase at a slower rate over the rest of the year than they have over the year, though the expected rise in steel prices will undoubtedly mean another round of price boosts for steel-using products. A combination of extra capacity, stiffer competition and consumer resistance, however, is making it harder in most industries to add any more to price tags.

21 Story Office Building To Be Built in Seattle

The first new office building to be built in Seattle in 25 years will be constructed in the city's financial district early next year.

The building will be a 21 story structure providing 198,000 sq ft of rentable floor space above the fourth floor. Located on a sloping site, the first four floors will be devoted to parking and service areas; 200 cars will be handled in the parking areas.

The building will be enclosed with tinted glass set in vertical aluminum frames; 70 ft prestressed concrete joists spanning the floors will eliminate the need for interior supporting columns.

The structure will cost over $10 million and is expected to be opened in mid 1959. It will be under the management of the Metropolitan Building Corp.

Architects for the building are Jones & Bindon, Seattle. Skidmore, Owings and Merrill, San Francisco, are consultants.

An early start is planned on construction. First step will be demolition this summer of two existing structures.

Construction Executive to Head Accountants Group

Allen D. Henry, vice president of Chas. H. Tomkins Co., a major Washington, D. C., construction firm, has been elected president of the Washington, D. C., Chapter of the National Association of Cost Accountants.

State Boosts Road Funds

North Carolina revamps highway administration and approves road spending of $395 million

Highway administration and highway financing took the spotlight at the North Carolina legislative session. The lawmaking body, now adjourned, approved a $395 million highway spending budget for the 1957 to 1959 biennium and completely reorganized the State Highway Commission.

The legislature also revamped the Building Code Council, authorized the adoption of a statewide building code, reduced or eliminated rights-of-way payments by towns, authorized a $10 million bond issue for state schools and institutional improvements, and revised the water resources program.

• **Highway Commission changes**—In reorganizing the Highway Commission, the legislature created the new position of Director of Highways, reduced the commission's membership from 14 to 7 and removed control of the prisons system from the commission.

Under the new commission setup, the Director of Highways, to be a career man, will be chief administrative officer of the Highway Department instead of chairman of the Highway Commission.

The highway director will be appointed by the commission with the approval of the governor. In addition, there will be a controller who will be the Highway Department's financial officer. There also will be a chief highway engineer.

• **Authority defined**—The new law gives the commission specific authority to:

- Build controlled access highways.
- Designate existing highways as controlled access facilities.
- Condemn land for controlled access highways.
- Pay property owners for their loss of road access.

Although the commission membership was reduced from 14 to 7, the state's highway divisions will be retained, but only as an administrative measure. The commission members remaining will represent the state's highway interests as a whole rather than the single division that they were once appointed to represent.

• **Highway budget**—Of the $395 million highway spending budget, $252 million will be state expenditures with the remainder coming from the federal government. Nearly half of the highway spending will provide new roads, including the state's share of the interstate system.

Funds amounting to $4 million also were appropriated for improvement of the state's secondary and county roads. This was a new item in the budget.

To facilitate road construction through municipalities, the communities will pay only 20% of rights-of-way acquisition inside corporate limits instead of the present 33%. In addition, the communities will not have to pay any right-of-way costs for highways included in the interstate system.

• **Building code**—The State Building Code Council was given the power to adopt a statewide building code and to approve local building codes. Local codes approved by the council would supersede the state code.

Membership of the council also was enlarged to include two engineers, a municipal building inspector and one layman to represent the public. And to reduce paper work for builders, a special committee was formed to coordinate the activities of state agencies in the field of building regulations. Instead of submitting plans to several agencies for approval, builders will mail in only one set of plans to the committee.

Pay increases of 11% across the board for highway employees were approved.

• **Other actions**—The legislature also:

- Gave power companies condemnation rights for acquisition of rights-of-way for coal-carrying pipelines.
- Created mosquito control districts with taxation powers.
- Defined duties of both the Conservation and Development Department and the state Board of Water Commissioners to eliminate duplication of activities in the water resources program.

• **Measures defeated**—Bills defeated included one that would have levied a gross receipts tax on contractors in place of the present license tax system and another that would have established a 75 cent minimum wage law for intrastate commerce and industry.

(*B&F continued on page 136*)

Attack on Slums

Urban renewal projects approved in Los Angeles

The Housing and Home Finance Agency has approved plans for the redevelopment of the semi-slum Bunker Hill area in downtown Los Angeles. Also approved were renewal programs in both the Bunker Hill and Sawtelle areas.

Under the renewal programs the Federal Housing Administration will insure long-term loans to individual property owners in both areas for improvement, expansion or new construction.

The redevelopment program, sponsored by the Los Angeles Community Redevelopment Agency, will cover a 130 acre area in Bunker Hill.

• **Appraisals to start**—William Sesnon, executive director of the area's redevelopment agency, said land appraisals will start immediately, but loan amounts will not be determined until the appraisals are completed.

The redevelopment program calls for the replacement of blighted structures in the area overlooking the Los Angeles Civic Center with multi-story commercial, hotel and residential structures. Extensive parking facilities also will be provided. Total cost of the project has been estimated at $150 million to $299 million, including a joint city-federal expenditure of about $40 million for site clearance and basic facilities.

• **Renewal program**—The renewal loans will be made in the 286 acre Sawtelle area on the western edge of the city. This program is an extension of the slum clearance and rehabilitation projects directed by the Los Angeles Building and Safety Department since 1952. The FHA loans will go to individual property owners and not to the city.

Los Angeles now is the first West Coast city to be certified for mortgage insurance for property renewal without the aid of federal loans or grants.

Growing in Canada

Stone & Webster, Kaiser add building facilities

Two United States companies have expanded the facilities of their Canadian subsidiaries through acquisition of additional office facilities or purchase of an existing company.

Henry J. Kaiser Co., Canada, Ltd., bought the business of Terminal Construction Co., Ltd., of Montreal while Stone & Webster Canada, Ltd., Toronto, has leased new office space in that city for a design and drafting group.

• **No management change**—Edgar F. Kaiser, chairman of the Canadian subsidiary, said its acquisition will be continued under the name of Terminal Construction Division of Henry J. Kaiser Co., Canada, Ltd. The division will be operated by the same management and construction personnel who conducted the Terminal firm prior to its purchase.

T. H. Stevenson, former president, and T. C. Thompson, former vice president of Terminal Construction for the last 10 years, were elected president and vice president, respectively, of Henry J. Kaiser Co., Canada, Ltd. They will have a substantial stock interest in the Kaiser subsidiary.

Terminal Construction has operated in all 10 Canadian provinces and currently is working on defense installations in Newfoundland and air base construction in Labrador.

• **Integrated organization**—Stone & Webster's design and drafting group will be expanded to a fully integrated engineering, design and construction organization.

The company will make fullest possible use of Canadian engineers and designers for its operations throughout the dominion.

The company's subsidiary holds the contract for the 800,000 kw expansion of the Richard L. Hearn Generating Station at Toronto, a facility of the Hydro-Electric Power Commission of Ontario. The firm designed and built the initial 400,000 kw installation in 1949.

Developers Split

Project partnership ends for Haas-Haynie-Utah

Haas-Haynie-Utah, a joint venture of two San Francisco construction firms for development of an industrial park, has been dissolved as a result of a diversification move.

The organization was a joint venture of Haas & Haynie and Utah Construction Co., which had as its major project the development of the 400 acre South San Francisco Industrial Park.

In a diversification move, the two construction companies in the partnership traded some of the South San Francisco acreage for property in downtown San Francisco. Extent of the firm's downtown holdings was not disclosed.

• **Efficiency the reason**—Robert Haynie, president of Haas & Haynie, said the operations would be more efficient if each firm concentrated on one tract.

Utah Construction Co. will keep and develop the suburban acreage at South San Francisco; Haas & Haynie will retain and develop the land in San Francisco's downtown area.

The first operation of the latter company will be construction of a 20 story, $5 million steel frame office building. The building, to contain approximately 200,000 square feet, will be started next April. It will be known as the 111 Pine St. Building.

• **Financing obtained**—Mr. Haynie said he has arranged financing through San Francisco insurance firms, with some equity financing obtained from investors in the East. Some major tenants also have been obtained.

Utah Construction Co. plans the construction of four buildings on its site shortly.

Road Commission to Issue $11.8 Million in Bonds

The Municipal Finance Commission approved $11.8 million in revenue bonds for issuance by the Wayne County, Detroit, Road Commission.

The largest single issue of $6.5 million will go for construction of a terminal building at the Wayne County Airport. Other issues will be used for school buildings, a library, a fire station and other improvements.

Ford Motor Donates Land For Use as College Campus

Ford Motor Co. has donated 75 acres to the Dearborn Board of Education as the site of a new Henry Ford Community College campus.

Henry Ford II said the contribution is a continuation of the company's industry-education cooperation program initiated last year (ENR Jan. 10, p. 100). The land is adjacent to a tract given by the company to the University of Michigan.

Business Briefs . . .

• **High yield**—Fannie Mae will pay 4¼% interest on its $100 million in debentures sold recently.

• **Bond issues voted**—Voters in San Jose, Calif., approved bond proposals totaling $23.5 million. The largest single issue of $12.3 million will go for street improvements.

Expert bond service *on the spot*

Need a bond? A call to your Travelers agent will put a bond specialist on the spot in no time.

He's an expert on local requirements. He knows just what you need and what you don't need. And he can get it for you without wasting time.

You'll find he's familiar with construction bond problems—understands *your* problems, too. And most important of all, he represents The Travelers—a company with a nation-wide reputation for getting bonds to responsible contractors FAST.

The Travelers complete service for contractors also includes:

Workmen's Compensation and Public Liability insurance with effective safety engineering to reduce accidents.

Equipment Floaters and *Builders' Risk* insurance backed by a claim organization that can give you prompt attention anywhere.

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All forms of business and personal insurance including
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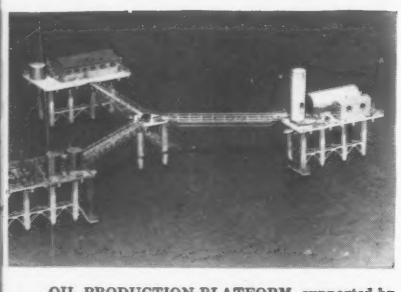
FLEET BERTHING PIER

Newport Naval Base • Newport, Rhode Island

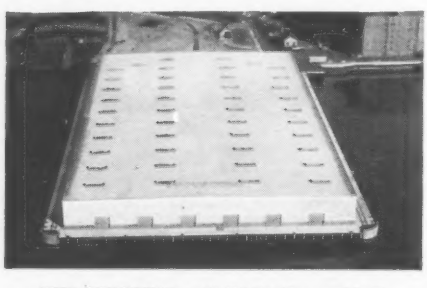
A full complement of 24 destroyers berthed at the new 1,350 ft. long, 100 ft. wide Raymond-built pier.

Offshore and Waterfront Installation



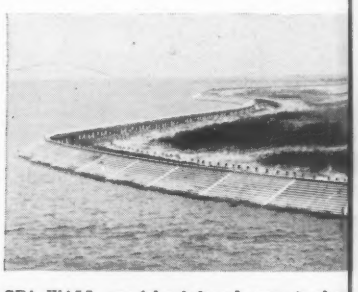
OIL PRODUCTION PLATFORM, supported by Raymond Prestressed Concrete Cylinder Piles off the Louisiana Gulf Coast for Shell Oil Co.

TEXAS TOWER, the world's first radar island, off the New England coast, was a joint venture of Raymond-DeLong.



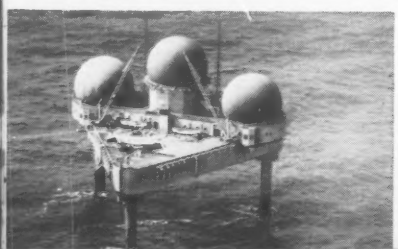
SHIP TERMINAL, a $6,000,000 Raymond-built structure for the Port of Boston, at East Boston, Mass. One of the country's largest.

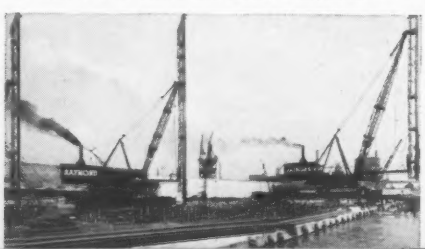
ORE DOCKS for Great Lakes Steel Corp., Zug Island, Mich. Shown here during construction.



SEA WALL, special reinforced concrete shore protection at Lake Pontchartrain, on the outskirts of New Orleans, La.

LOADING DOCK for the American Sugar Refining Co., outside of New Orleans, La.





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The complete construction of waterfront and offshore structures has been an integral part of Raymond's wide scope of activities, both at home and abroad, for many years. On these pages are a few examples of the number of wharves, jetties, sea walls, navigational aids, piers, oil drilling platforms and other similar contracts we have completed recently.

In addition, we continually strive to improve our service, methods and material. Our latest development is the Raymond Prestressed Concrete Cylinder Pile. Designed specifically for offshore and waterfront projects and bridges, this low-cost, fireproof support assures greater structural strength, increased load capacity and longer life and is not subject to corrosion or damage by marine life or water. Furthermore, it has a particularly strong resistance to bending from the force of waves and winds. Investigate the advantages of using Raymond methods, materials and experience on your next waterfront or offshore project.

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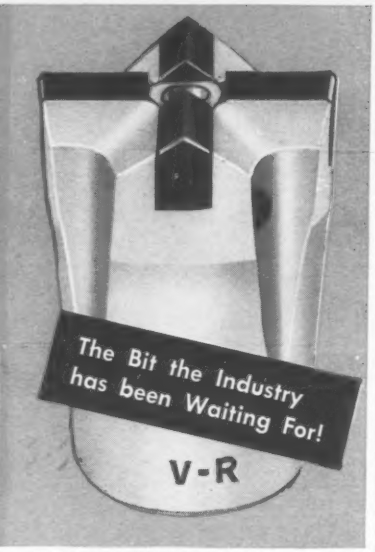
Carbide Percussion Bit



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With this new bit, you use new or reconditioned steels. No threading. No sharpening. When a bit is used up, simply remove and put a new one on the same drill steel. You cut steel costs.

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Exclusive V-R Quality Carbides—developed and manufactured by V-R, since 1930 a leader in the carbide industry. Exceptional purity, plus shock and abrasion resistance means longer carbide life.

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Try them . . . and you'll buy them—the bits that are beating them all: V-R BITS.

V-R "H" Style 6° Taper Short Body Push-On Bit			
Bit Sizes	Class	Steel Sizes	T Diam
1¼" through 1⅝"	A	⅞"	.776 +.002 −.000
1⅝" through 1⅞"	B	1" and 1⅛"	.920 +.003 −.000
2" through 2¼"	C	1⅛" and 1¼"	1.157 +.003 −.000

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Five Year Labo

California continues to lead the construction industry in long-term labor contracts as current negotiations produce two more five year agreements.

A new five year contract for carpenters in San Diego County gives union members a 22½ cent wage boost now with 15 cents more next May and another 10 cents on Jan. 1, 1959. There's no change in fringe benefits except that contractors have agreed to provide iced drinking water at job sites from June to October. Cost items will be subject to reopening on May 1, 1959. Contract was negotiated by the Construction Industry Labor Relations Committee, representing the San Diego District Council of Carpenters, Associated General Contractors, Engineering and Grading Contractors, and San Diego Building Contractors.

At the same time, carpenters in Los Angeles ratified a five year contract with the AGC, Home Builders Institute, Building Contractors Association, and Excavating and Grading Contractors Association. Covering 11 southern California counties, the new pact provides for an immediate wage increase of 22½ cents, plus a 14 cent wage boost next May and a 10 cent pension fund contribution that will commence Jan. 1, 1959. New journeymen scale is $3.975.

• **Other settlements**—Three year contracts, meanwhile, have continued to hold their own.

In New York City, the glaziers, first of the trades to settle out of the 20 now negotiating, have agreed to a package increase of 50 cents in a three year pact, pushing the journeymen scale to $3.95. A 10 cent wage boost goes into effect July 1, followed in succeeding years by two increments of 15 cents each. A 10 cent employer contribution to a vacation fund becomes effective next month; lunch periods are increased from 30 to 45 minutes; and those working on swing scaffolds will receive premium pay of 20 cents.

A bigger boost—52 cents—has been achieved by the trowel trades of Dade County, Fla., in a three year contract with the AGC of South Florida, Home Builders Association of South Florida, Tile, Marble and Terrazzo Association and the Contracting Plasterers Association. The wage hike is payable in four installments—10, 10, 15 and 17 cents.

A mid-month settlement of shorter duration—two years—has ended a five week strike of sheet metal workers in

acts Concluded

Idaho and eastern Washington. Under the new agreement with the Inland Empire Sheet Metal Contractors Association, union locals in Spokane, Walla Walla and Richland will receive a 37 cent wage boost and other benefits that shape up like this: 25 cents retroactive to May 1; 12 cents next May 1; an increase in health and welfare payments from 7½ to 10 cents and in vacation benefits from 6 to 10 cents; a 10% differential for foremen and one of 20% for general foremen.

In Newark, Ohio, the laborers union has ended a 28 day strike against the Newark Contractors Association with a one year contract that grants a 10 cent wage increase retroactive to May 1, plus another 5 cents on Aug. 1.

• **Strikes**—But in some areas negotiations were at a standstill last week.

Some 550 plumbers and pipefitters walked off their jobs in Wilmington as their old contracts expired. The union which now has a $3.40 scale, is asking for 40 cents over a two year period, plus 10 cents for a pension plan.

In Miami members of the lathers union, whose contract expired Mar. 31, were idled as wage talks hit an impasse. Demands include a 25 cent wage hike, minimum travel pay of $3.50 a day beyond a 15 mile radius, and a seven hour day from Jan. 1 to July 1 to spread out the work during the slack season. The latter reflects the housing downturn.

Plumbers Score Taft-Hartley Inequities

Union president claims law prevents members from asserting contract rights on fabricated material

President Peter T. Schoemann of the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry has charged that the Taft-Hartley Act, as presently applied to the construction industry, violates one of the basic principles of collective bargaining—it denies a union the right to protect, through contract enforcement, the wages and working conditions it has achieved.

In a blistering attack on the vagaries of the law, Mr. Schoemann cites a current dispute between the UA and United Engineers and Constructors, Inc., to support his charge. His basic contention is that on a construction job in River Rouge, Mich., the UA has been denied the right to enforce a legitimate contract clause that prohibits the use of prefabricated materials made in non-UA shops.

And into the orbit of this particular dispute has been drawn some of the industry's most perplexing labor problems—secondary boycotts, hot-cargo clauses, jurisdictional disputes, judicial settlement of problems that should be handled by the National Labor Relations Board instead of the courts, and the tendency of legal delays to render many disputes academic before they are settled.

• **The dispute**—The dispute cited by Mr. Schoemann in the current issue of the "UA Journal" arose at Detroit Edison Co.'s River Rouge plant, where the nation's biggest generator is being installed. United Engineers and Constructors, contractor for the project, has a national agreement with the UA in which the UA reserves the right, in typical hot-cargo clause language, not to handle on any job fabricated materials which are not made by building tradesmen employed under a UA contract and "receiving the prevailing building construction rate in effect wherever the pipe fabricating shop may be located."

Avowed purpose of the clause is to prevent further loss of work to unions or employees in jurisdictional competition with the UA and to prevent UA wage scales from being undermined by cheaper rates paid off the job site.

The River Rouge hitch came through a contract clause between Detroit Edison and United Engineers—Detroit Edison reserved the right to furnish materials for the job, thus putting United Engineers in "a trying situation." Five carloads of materials delivered under that clause were made at Westinghouse Electric's Philadelphia plant, where wage rates are lower than those of the building trades. Exercising their contract rights under the UA agreement, members of Steamfitters' Local 636 refused to handle the material.

• **The aftermath**—According to Mr. Schoemann, the dispute was with United Engineers only and occurred at a job site "occupied exclusively by United Engineers." The effect on Westinghouse and Detroit Edison was merely "incidental" to the primary dispute.

The NLRB issued an unfair labor practice complaint, based on the secondary boycott provisions of the law, against both the UA and Local 636. From a Federal District Court the NLRB obtained an injunction against the local but not against UA.

Net result, Mr. Schoemann says, is this:

• The Taft-Hartley Act has tied the hands of its affiliate, denying it the right to see that its labor contract clauses are complied with.

• The NLRB's action has abridged the right to strike granted in the law.

• Through the injunction—which the court could not issue without a reasonable belief that a secondary boycott existed—the court has "practically decided the case" before the NLRB has even held a hearing.

• By the time the NLRB gets around to ruling on the dispute, the work will have been completed and what "the board decides will make little difference to the men who lost the work to which they were justly entitled" under contract law.

Michigan Building Trades Form a New State Council

The Michigan State Building and Construction Trades Council, representing 18 building trades in the state, officially came into being last month, when more than 500 delegates gathered in Lansing to adopt a constitution and to organize the council.

President of the council is Lucien M. (Boots) Weir, head of the Carpenters District Council and Executive Secretary of the Detroit Building Trades Council. Mr. Weir is a long-time foe of the teamsters' James Hoffa, long influential in teamster affairs.

Labor Briefs . . .

• **Taft-Hartley**—Sunday, June 23, was the 10th anniversary of the Taft-Hartley Act, and AFL-CIO President George Meany reaffirmed labor's pledge to seek a "broad-scale revision and improvement" of the law. He referred to it as "an ill-conceived statute, designed not to promote better labor-management relations, but to punish labor."

• **Beck's successor?**—Joseph Diviny of San Francisco, has announced his candidacy for the presidency of the teamsters union.

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.10 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record, P.O. Box 12, New York 36, N. Y.

Bids: August 15, 1957

Power Authority of the State of New York Niagara Power Project

ADVERTISEMENT FOR PROPOSALS
FOR
THE FURNISHING AND DELIVERY
OF
167,000 KVA GENERATORS
FOR
LEWISTON POWER PLANT
SPECIFICATIONS NO. PA-N-25002
NIAGARA CONTRACT NO. NP4

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the furnishing and delivery thereof f.o.b. Model City, New York of 167,000 KVA Generators for the Lewiston Power Plant in Lewiston, Niagara County, New York, until 10:30 A.M. Eastern Daylight Saving Time on the 15th day of August, 1957, at the Authority's Office, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place proposals will be publicly opened and read aloud.

Bids will be entertained for 13, 7 or 6 generators and associated equipment in accordance with the bidding schedules.

Delivery of generator parts will be required beginning on or before May 1, 1959.

Bids will not be restricted to American manufacturers.

Plans, Specifications and Proposal Forms for the work, may be obtained from the Power Authority of the State of New York, at 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York upon application and prepayment of a fee of Ten ($10.00) dollars per initial set of contract documents, and Five ($5.00) dollars per set for additional sets, no part of which will be refunded. Plans, Specifications and Proposal Forms for the work will be on file in the Authority's Office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and may be inspected by prospective bidders during office hours.

Bids must be made in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 10 percent of the maximum price bid for any bid schedule.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

PA-N-25002

Bids: July 8, 1957.

Sewage Pumping Stations

Sealed proposals will be received until 11:00 A.M. EST, July 8, 1957, in the office of the City Commission of Fort Lauderdale, Florida for construction of Project No. 621 Area "B" Sewage Pumping Stations B1 and B2.

Bidding blanks may be obtained from the office of the City Engineer. Plans, Specifications, and Contract Documents are on file in the office of the City Engineer.

A deposit of $25.00 for Plans and Specifications, and of $15.00 for each additional set of plans or specifications, will be required. All deposits for plans and specifications will be refunded upon their return in good condition within 10 days of the opening of bids.

A certified check, cashier's check or bank officer's check, for 2% of the total amount of the bid, made payable to City of Fort Lauderdale, Florida, shall accompany each proposal as evidence of good faith and responsibility of the Bidder. This check shall be retained by the payee as liquidated damages should the Bidder refuse or fail to enter into a contract with the payee for the execution of the work embraced in the Proposal, in the event the Proposal of the Bidder is accepted.

The City Commission reserves the right to reject any or all bids.

William J. Veeder
City Manager

Bids: July 22, 1957.

Construction of Sewage Treatment Plant

Sealed proposals will be received by the Borough of Camp Hill, Cumberland County, Pennsylvania, at the office of the Borough Secretary, in the Munncipal Building, 2201 Market Street, Camp Hill, Pennsylvania, until 7:30 P.M., Eastern Daylight Saving Time, July 22, 1957, and will be publicly opened and read shortly thereafter, for furnishing all necessary labor, materials and equipment, and performing all work required for the Contracts noted below. Separate proposals will be received upon three (3) parts of the project as hereinafter indicated. Each proposal shall be accompanied by a certified check or a bid bond in an amount not less than ten (10) per cent of the total bid, in accordance with the provisions contained in the Specificatjons.

Copies of the Contract Documents, including Drawings and Specifications, not to exceed two sets of any particular contract to a prospective bidder or supplier, may be obtained from the office of Gannett Fleming Corddry and Carpenter, Inc., 600 North Second Street, Harrisburg, Pennsylvania, where they will also be on file for inspection purposes. The deposit requested for each set is as follows:

Contract One
GENERAL CONSTRUCTION OF ADDITIONS TO SEWAGE TREATMENT PLANT $20.00

Contract Two
HEATING WORK IN CONNECTION WITH CONSTRUCTION OF ADDITIONS TO SEWAGE TREATMENT PLANT $15.00

Contract Three
ELECTRICAL WORK IN CONNECTION WITH CONSTRUCTION OF ADDITIONS TO SEWAGE TREATMENT PLANT $15.00

Full refund will be made to actual bidders only for return of one set, no more, of a particular contract in good condition within fifteen (15) days after opening of bids; refund for return of all other sets in good condition within the same period will be fifty (50) per cent of deposit.

The Borough reserves the right to reject any and all bids and also reserves the right to waive irregularities in said bids or proposals.

Gannett Fleming Corddry &
Carpenter, Inc., Engineers
600 North Second Street
Harrisburg, Pennsylvania

BOROUGH OF CAMP HILL
Cumberland County,
Pennsylvania

Bids: July 18, 1957

Cleaning and Painting Bridges

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Canal Law and Highway Law, sealed proposals will be received, until 10:30 A.M., D.S.T., on July 18, 1957 by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

Contract M 57-11 for Cleaning and Painting Twelve Bridges over the Erie Canal in Orleans County, New York. Engineer's Estimate for M 57-11 is $28,500.00.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor, Gov. A. E. Smith State Office Bldg., Albany, New York.
(b) Department of Public Works, 270 Broadway, New York City, New York.
(c) In addition to the above mentioned offices, plans, maps and specifications for Contract M 57-11 may be examined and obtained at the office of Mr. B. F. Perry, District Engineer, Barge Canal Terminal, Rochester, New York.

The deposit for Plans and Proposal Forms for Contract M 57-11 is $10.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Proposals for M 57-11 must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" in the amount of $1,500.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Canal Law and to the Highway Law as set forth in "Instructions to Bidders" in the contract specifications.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: July 8, 1957.

Construction of Sanitary Sewers

Sealed bids will be received until 11:00 A.M., EST, on July 8, 1957 in the office of the City Commission of Fort Lauderdale, Florida, for the construction of sanitary sewers in Area "B" consisting of approximately 25,900 linear feet of gravity sewers and appurtenances. This contract to be known as "Contract A", Improvement 997.

Bidding blanks may be obtained from the office of the City Engineer. Plans, specifications, and contract documents are on file in the office of the City Engineer.

A deposit of $25.00 for plans and specifications, and of $15.00 for each additional set of plans or specifications, will be required. All deposits for plans and specifications will be refunded upon their return in good condition within 10 days of the opening of bids.

A certified check, cashier's check of bank, officer's check, for 2% of the total amount of the bid, made payable to City of Fort Lauderdale, Florida, shall accompany each proposal as evidence of good faith and responsibility of the Bidder. This check shall be retained by the payee as liquidated damages should the Bidder refuse or fail to enter into a contract with the payee for the execution of the work embraced in the Proposal, in the event the Proposal of the Bidder is accepted.

The City Commission reserves the right to reject any or all bids.

William J. Veeder
City Manager

U. S. Government

Sealed bids will be received in the office of the Engineering and Construction Director, Panama Canal Company, Balboa Heights, Canal Zone until 10:00 A.M., E.S.T., August 21, 1957 and at that time publicly opened for the following work: Furnishing all plant, labor, materials, equipment and services and performing all work required to replace switchgear in the Miraflores substation. This work consists of demolition of existing concrete switch cells, bus structure and instrument transformer compartments; furnishing and installation of 23 units of 2.4 KV and 12 units of 12 KV metal clad switchgear, a five (5) panel duplex control board, two (2) 5000 KVA, 3 phase, 60 cycle transformers and one (1) 10,000 KVA, 3 phase, 60 cycle power transformer. It also consists of removal of 25 cycle transformers from the substation, alterations to switch structure in high tension room, the installation of nine (9) 44 KV oil circuit breakers and the relocation of approximately 1000 feet of 44 KV transmission line. Specifications and drawings are available for examinations at the office of Chief of Procurement, Panama Canal Company, 21 West Street, New York 6, New York and may be obtained upon payment of a deposit of $50.00 which is refunded if data are returned within 40 calendar days after bid opening. For further information contact this office, 21 West Street, New York 6, N. Y. Telephone Bowling Green 9-5380, extension 56.

OFFICIAL PROPOSALS

Bids: July 18, 1957.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, Canal Law and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 18th day of July 1957, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1; G. L. Nickerson; District Engineer, 353 Broadway, Albany 1; N. Y.:						
Albany	FASS 57-8	South Bethlehem-Feura Bush Co. Rds. 53, 54 and 102 Project S-483(1)	4.14	Asphalt Concrete	$25,000 Plans $15	$421,000
Albany & Saratoga (Rte. 9)	FARC 57-126	Louden-Crescent, Pt. 2, S.H. 5614; Clifton Park-Crescent, Pt. 2, S.H. 5639. Project F-639(10)	0.44	Asphalt Concrete=0.37 Mi.; Misc. Work=0.07 Mi.; Welded Plate Girder 5 Spans 1135′	$190,000 Plans $15	3,523,000
Saratoga	FASSRC 57-100	Charlton-County Line, FAS-SS 38-8; Charlton-Ballston Center, FASS 48-15. Project S-59(3)	8.38	Asphalt Concrete	$15,000 Plans $10	283,000
Saratoga	PSC 6627 PSC 7027	Railroad Relocation and Elimination of Various D. and H. R.R. Grade Crossings in the City and Vicinity of Saratoga Springs	19.87	New Tracks, Buildings & Misc. R.R. Work=11.61 Mi.; Cem. Conc. Pavt.=1.48 Mi.; Asp. Conc.=5.31 Mi.; R.O.B. Gravel Detours & Connections=1.47 Mi.; 10 R.R. Sep. Structures & 1 Box Bridge	$400,000 Plans $100	7,055,000
Saratoga (Rte. 9P)	RC 57-123	Malta-Bemis Heights, Pt. 1, S.H. 1528	0.17	Asphalt Concrete	$2,500 Plans $10	43,000
DISTRICT No. 3, Wm. Robinson, District Engineer, Weigh Lock Building, 301 E. Water St.; Syracuse, N. Y.						
Oswego (Rte. 57)	FARC 57-125	Fulton-Oswego, S.H. 5382 Project F-U-583(5)	7.20	9″ Cem. Conc. Pavt. 24′-48′ Wide Precast Concrete Slab Br. 36′	$95,000 Plans $15	1,750,000
DISTRICT No. 4, B. F. Perry, District Engineer, Barge Canal Terminal; Rochester 1; N. Y.:						
Genesee (Rte. 19)	FARC 57-101	Le Roy-Brockport, Pt. 3, S.H. 1730 Project S-451(1)	2.88	Asphalt Concrete	$11,000 Plans $10	200,000
Livingston (Rtes. 5 & 20)	FARC 57-102	Avon-Lima, S.H. 5302 Project F-343(13)	2.67	Asphalt Concrete	$8,000 Plans $10	142,000
Monroe (Rte. 19)	FARC 57-104	Hamlin, Pt. 1, (Brockport-Hamlin), S.H. 80; Hamlin; Pt. 2, (Hamlin-N. Hamlin), S.H. 81. Project S-509(1)	4.21	Asphalt Concrete	$16,000 Plans $10	293,000
Wyoming (Rte. 20A)	FARC 57-105	Varysburg-Warsaw, Pt. 2, S.H. 1349A Project F-767(2)	1.67	Asphalt Concrete	$5,500 Plans $10	106,000
DISTRICT No. 5, E. G. H. Youngmann, District Engineer, State Office Bldg.; 65 Court St.; Buffalo 2; N. Y.:						
Chautauqua (Rte. 60)	FARC 57-106	Sinclairville-Casadaga, Pt. 2, S.H. 1012-1012A Casadaga-Fredonia, S.H. 938 Project F-1117(1)	6.27 (1.83 Acc.)	Asphalt Concrete=6.49 Mi.; 9″ Cem. Conc. Pavt. 24′ Wide=1.24 Mi.; Misc. Work=0.37 Mi.; Reinf. Conc. Arch Br. 68′	$122,000 Plans $25	2,206,000
Erie	FINTC 57-2	New York State Thruway—Niagara Section—Subs. N3 and N4 (Louisiana St. to Washington St.) Project I-865(15)	0.77	9″ Cem. Conc. Pavt. 2 @ 37′ Var. Wide=0.72 Mi.; Misc. Work=0.05 Mi.; 39 Span Comp. Beam Viaduct 2670′; 65 Reinf. Conc. Piers for Ramps	$600,000 Plans $100	10,007,000
Niagara	M 57-7	Bridge E-222 Over Erie Canal at Gasport		Reconstructing Control Cabin	$800 Plans $10	14,000
DISTRICT No. 7, R. W. Sweet, District Engineer, 444 Van Duzee Street, Watertown; N. Y.						
Clinton & St. Lawrence	RC 57-108	Br. No. 1, S.H. 476; Br. No. 1, S.H. 5311; Br. No. 2; S.H. 777; Br. No. 2 and Br. No. 3, S.H. 1548; Br. No. 1; S.H. 1263; Br. No. 1, S.H. 8241 and Br. No. 2, S.H. 8199		Cleaning and Painting 8 Bridges	$1,300 Plans $10	23,000
St. Lawrence (Rte. 37A)	FARC 57-107	Ogdensburg-Waddington, S.H. 9357 Project F-650(6)	13.62	Asphalt Concrete, Ty. 1A	$23,000 Plans $10	430,000
DISTRICT No. 8, K. G. Rauer, District Engineer, Pleasant Valley Road, Poughkeepsie; N. Y.						
Columbia (Rte. 9)	FARC 57-109	Hudson-Stockport, S.H. 341 Project F-368(10)	2.47	Asphalt Concrete	$6,000 Plans $10	106,000
Columbia (Rte. 9)	FARC 57-110	Blue Stores-Livingston, S.H. 5004 Project F-322(14)	2.59	Asphalt Concrete	$7,000 Plans $10	134,000
Dutchess	FESS 57-9	Old Route 22: County Road No. 81 Project ER-67(1)	0.13	Repair Exist. 65.1′ Bridge	$1,000 Plans $10	19,000
Dutchess (Rte. 22)	FARC 57-111	Millerton-County Line, S.H. 709 Project F-350(22)	1.39	Asphalt Concrete	$2,500 Plans $10	48,000
Dutchess (Rte. 9)	FARC 57-112	State Hospital, S.H. 9003; Poughkeepsie-Hyde Park, S.H. 453. Project F-322(15)	1.93	Asphalt Concrete	$6,000 Plans $10	105,000
Rockland (Rte. 59)	RC 57-113	Nyack Village: Main Street, S.H. 8459	0.06	Asphalt Concrete	$1,600 Plans $10	29,000
Ulster (Rte. 212)	RC 57-114	Willow-Mount Pleasant S.H. 1882	0.10	Slope Protection	$1,600 Plans $10	28,000
Westchester (Rte. 9)	FARC 57-115	Broadway-Irvington Village, S.H. 8456 Project F-682(7)	1.86	Asphalt Concrete	$5,300 Plans $10	94,000
Westchester (Rte. 9)	FARC 57-116	Broadway-North Tarrytown Village, S.H. 8457 Project F-682(6)	1.46	Asphalt Concrete	$4,000 Plans $10	75,000
Westchester (Rte. 100)	FARC 57-117	Yonkers-White Plains, S.H. 5231 Project F-243(3)	2.36	Asphalt Concrete	$8,000 Plans $10	154,000
Westchester (Rte. 22)	FARC 57-118	White Plains-Armonk, Pts. 1 and 2, S.H. 20 and S.H. 35 Project F-418(4)	2.84	Asphalt Concrete	$8,000 Plans $10	148,000
DISTRICT No. 9, J. C. Frederick, District Engineer, 71 Frederick Street, Binghamton, N. Y.						
Broome (Rte. 11)	FARC 57-119	Castle Creek-Whitney Point, S.H. 1450-A Project F-717(4)	3.66	Asphalt Concrete	$19,000 Plans $10	350,000
Broome (Rte. 17)	FARC 57-120	Binghamton-Windsor, Pt. 4, S.H. 5241; Windsor-Deposit, S.H. 5338. Project F-344(22)	4.27	Asphalt Concrete	$22,000 Plans $10	388,000
DISTRICT No. 10, M. E. Goul, District Engineer, 325 W. Main Street, Babylon, L. I.; N. Y.						
Suffolk (Rte. 111)	RC 57-122	East Islip-Smithtown Branch, S.H. 1208	3.09	Asphalt Concrete	$10,000 Plans $10	180,000
Suffolk (Rte. 27)	RC 57-124	Center Moriches-Westhampton, S.H. 8039	0.57	Asphalt Concrete	$2,500 Plans $10	47,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds.

Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: July 22, 1957

The Charlotteburg Reservoir Project

OFFICE OF THE DIRECTOR OF THE DEPARTMENT OF PUBLIC WORKS OF THE CITY OF NEWARK, NEW JERSEY
City Hall, Newark, N. J.
Date June 19, 1957
Job No. 4161 Division of Water Supply

Sealed proposals will be received at 10:00 A.M. Eastern Daylight Saving Time on July 22, 1957 by the Director of the Department of Public Works, in Room 312, City Hall, Newark, New Jersey, and then and there at 10:00 A.M. publicly opened and read for the following work which is a part of the Charlotteburg Reservoir Project:
CONSTRUCTING THE PEQUANNOCK AQUEDUCT EXTENSION, SCREEN CHAMBER, AND ECHO LAKE PIPE LINE, CONTRACT CRP-1, GENERAL CONSTRUCTION.

The work under this Contract includes, but is not limited to the following:

(a) Pequannock Aqueduct Extension: The Contractor will be required to furnish, lay and test approximately 2 miles of pressure pipe consisting of 48 inch I.D. steel and 42, 54, and 72 I.D. reinforced concrete pipe, including air relief and other valves, blow-offs and other appurtenances; and construct a reinforced concrete channel, access manholes, enclosing concrete structures, and do other miscellaneous work.

(b) Screen Chamber: The Contractor will be required to construct a reinforced concrete screen chamber substructure approximately 40 feet by 70 feet in plan. The Screen Chamber Superstructure, including structural steel, heating and electrical work, will be constructed under other contracts. The substructure will extend approximately 20 feet below grade and will be divided into compartments consisting of a valve chamber, duplicate blowdown chambers, duplicate screen wells, an overflow effluent well, a screen influent well and a screen effluent well.

(c) Echo Lake Pipeline: This pipeline will be approximately .55 miles long and will generally follow the abandoned roadbed of the Macopin Lake Branch of the New York, Susquehanna & Western Railroad from its intersection with the Echo Lake outlet channel to the future Charlotteburg Reservoir.

Approximately 800 feet of 36 inch concrete pipe for this line will be furnished by the City but will be laid and tested by the Contractor. The remainder of the line, consisting of 24 inch I.D. pressure pipe and 24 inch culvert pipe will be furnished, laid and tested by the Contractor. The Contractor will also be required to furnish and install appurtenances, construct manholes and enclosing concrete structures, and do other miscellaneous work.

The Drawings, Specifications and Information to Bidders, and the Proposal, Contract and Bond forms are on file and may be seen at the office of the Division Engineer, Division of Water Supply, Department of Public Works, Room 101, City Hall Annex, Newark and at the office of Parsons, Brinckerhoff, Hall & Macdonald, Engineers, 51 Broadway, New York, New York. Copies may be obtained at the office of the Division Engineer or at the office of Parsons, Brinckerhoff, Hall & Macdonald upon deposit of twenty-five dollars, which sum will be refunded upon return of the Drawings and Specifications in good condition.

An Agreement of Surety signed by a Surety Company authorized to do business in New Jersey shall accompany each proposal for execution of contract on award thereof. Said Agreement of Surety shall be in conformity with the requirements specified in Instructions and Information for Bidders.

The contract will be awarded to the lowest responsible bidder. The City reserves the right to reject any and all bids or waive informalities therein.

All proposals are subject to the requirements of all laws and City ordinances affecting same. The bidder's attention is called to Section 2.58 of the City Administrative Code.

By direction of the Director of the Department of Public Works of The City of Newark.

George W. Andress
Director, Department of Public Works

NOTICE TO ADVERTISERS

The July 11 issue will close for press on July 3.

OFFICIAL PROPOSALS

Bids: July 18, 1957.

Construction of Filter Equipment For the Central District Filtration Plant City of Chicago

The City of Chicago invites proposals for the "Construction of Filter Equipment, Section A for the Central District Filtration Plant" which will be received until 11:00 A.M., C.D.S.T., Thursday, July 18, 1957, at Room 401, City Hall, at which time and place all such proposals will be opened publicly.

The work for which such proposals are invited consists of furnishing and installing the filter underdrains and placing the gravel; constructing the wash water troughs; furnishing and placing the sand; and all other work appurtenant and collateral thereto. This work is located in the filter substructures, to be constructed by others, of the 960 MGD Central District Filtration Plant which is being built within a cofferdam, north of Navy Pier and east of Lake Shore Drive, Chicago, Illinois. The quantities of work include approximately 337,000 square feet of filter underdrain (cast iron pipe, Wheeler or Leopold Types) 38,000 tons of sand, 17,000 tons of gravel and 2300 poured-in-place or precast concrete wash water troughs.

The exact quantities of all material and work required are contained in Specifications and Contract Documents No. 80.391-57-1 which can be obtained from the Department of Purchases, Contracts and Supplies, Room 401, City Hall, Chicago, Illinois. A cash or certified check deposit of $50.00 will be required for each set of specifications with drawings.

Proposals must be made upon blank forms of proposal contained in the Contract Documents, be addressed to said Department of Purchases, Contracts and Supplies, and be accompanied by a proposal guaranty in cash, cashier's check, certified check or Comptroller's Certificate of moneys owed the bidder, in the amount of $100,000.00. Checks to be made payable to the City of Chicago, and drawn on some responsible bank located in the United States. Direct all correspondence and inquiries to:

John F. Ward, Purchasing Agent
Room 400, City Hall
Chicago 2, Illinois

Bids: July 18, 1957

Cleaning and Painting Bridges

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Canal Law and Highway Law, sealed proposals will be received, until 10:30 A.M., D.S.T. on July 18, 1957 by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

Contract M 57-9 for Cleaning and Painting Bridges over the Erie Canal in Niagara and Erie Counties, New York.
Engineer's Estimate for M 57-9 is $23,-200.00.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor, The Gov. Alfred E. Smith State Office Bldg., Albany, New York.
(b) Department of Public Works, 270 Broadway, New York City, N. Y.
(c) In addition to the above mentioned offices, plans, maps and specifications for Contract M 57-9 may be examined and obtained at the office of Mr. E. G. H. Youngmann, District Engineer, 65 Court St., Buffalo 2, New York.

The deposit for Plans and Proposal Forms for Contract M 57-9 is $10.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.
Proposals for M 57-9 must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" in the amount of $1,300.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Canal Law and to the Highway Law as set forth in "Instructions to Bidders" in the contract specifications.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: July 2, 1957.

Contract 446 Unwatering and Cleaning the Rondout-West Branch Tunnel of the Delaware Aqueduct

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A.M., Eastern Daylight Saving Time (10:00 A.M. Eastern Standard Time), on Tuesday, July 2, 1957, for Contract 446, for unwatering and cleaning the Rondout-West Branch tunnel of the Delaware aqueduct and for performing the work incidental to these operations. The work of this contract includes unwatering the tunnel and maintaining it in an unwatered condition until it has been cleaned and a final inspection made; moving pumps and other unwatering equipment owned by the City of New York from places of present storage, installation and use of such equipment and its subsequent removal and return to storage; furnishing, installation, operation and subsequent removal of a head frame, hoist, hoist house and appurtenant equipment; and furnishing, installation, use and removal of plant and equipment required for the cleaning of the tunnel, all as set forth in the specifications.

Pamphlets of the contract containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained in the Secretary's office, Room 1311 at the above address, upon application in person or by mail, by depositing the sum of $5.00 for each pamphlet. Within 30 days following the award of contract or rejection of bids the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of $4.00 will be made for each other pamphlet returned in acceptable condition.

IRVING V. A. HUIE, President, EDWARD C. MAGUIRE, HERBERT M. ROSENBERG, Commissioners; Board of Water Supply; BETTY COHEN, Acting Secretary.

Bids: August 2, 1957

Sault Ste. Marie Bridge Company Construction of Railroad Lift Bridge

Tenders are invited by the Sault Ste. Marie Bridge Company for the construction of a 370 foot railroad lift bridge over the south ship canal at Sault Ste. Marie, Michigan. Tenders must be delivered to the office of the Chief Engineer of the Soo Line Railroad Company, Minneapolis, Minnesota not later than 10 A.M., D.S.T. August 2, 1957.

Plans and specifications are on file for inspection at the Soo Line Office in Minneapolis and the Corps of Engineers Offices in Detroit and Sault Ste. Marie. Copies of plans and specifications will be furnished at a fee of $30.00.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4934) will be received at McCook, Nebraska, until July 23, 1957, for furnishing labor and materials for Earthwork and Structures, Driftwood Canal, Station 812+17 to Station 1563+15, Driftwood Subcanals, Laterals, and Drains, Missouri River Basin Project, Nebraska. Location near McCook, Nebraska. Principal items are 1,609,000 cu. yds. excavation; 208,000 cu. yds. compacting embankments; 85,000 cu. yds. earth lining for canal; 5,590 cu. yds. concrete; 14,300 lin. ft. concrete pipe; and other work. Completion time 280 and 600 days. For particulars, address Bureau of Reclamation, P. O. Box 737, McCook, Nebraska; or Building 53, Denver Federal Center, Denver, Colorado. W. A. Dexheimer, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4935) will be received at Vernal, Utah, until July 25, 1957, for furnishing labor and materials for 500,000-gallon Water Storage Reservoir for Flaming Gorge Unit, Colorado River Storage Project, Utah-Wyoming. Location approximately 16 miles southeast of Linwood, Utah. Principal items are furnishing, erecting, testing, and painting one 500,000-gallon insulated steel water storage reservoir and other work. Completion time 300 days. For particulars, address Bureau of Reclamation, Vernal, Utah; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

OFFICIAL PROPOSALS

Bids: July 22, 1957

Municipality of Metropolitan Toronto Department of Works Humber River Sanitary Trunk Sewer Contracts D-3-57 and D-4-57

SEALED TENDERS will be received for the construction of the Humber River Sanitary Trunk Sewer, Contract D-3-57 and Contract D-4-57 in the Township of Etobicoke and in the Township of York, all within the Municipality of Metropolitan Toronto.

The work included consists of constructing approximately 0.6 miles of 9 foot-0 inch internal diameter sewer in tunnel and open cut of unreinforced and reinforced concrete section and 2.2 miles of 8 foot-6 inch equivalent diameter unreinforced concrete sewer tunnel, with manholes, adits, overflow structure, and an 8 foot-0 inch diameter reinforced concrete overflow pipe in open cut, alignment holes, and all other appurtenances and related works necessary to complete the sewer from a point on the site of the Humber Sewage Treatment Plant to its northerly terminus at the south limit at the Lambton Golf and Country Club.

The work has been separated into two contracts, namely, Contract D-3-57 extending northerly and westerly from the Humber Sewage Treatment Plant to a point on Riverwood Parkway, a distance of approximately 3283 linear feet, and Contract D-4-57, extending westerly and northerly from Riverwood Parkway to a point on the Lambton Golf Course north of the Canadian Pacific Railway tracks, approximately 11,498 linear feet. Tenderers may tender on either Contract or may submit a combined tender for carrying out the work of both contracts as one.

Tenders must be addressed to the Chairman and Members of the Executive Committee, the Municipality of Metropolitan Toronto and must be delivered to the Metropolitan Clerk at his office, 67 Adelaide Street East, Toronto 1, not later than Twelve o'clock noon (Eastern Daylight Time) on Monday, July 22, 1957.

Envelopes containing tenders must be plainly marked on the outside as to their contents. Plans of all Contracts and Contract Documents may be obtained at the Metropolitan Department of Works, 171 Eglinton Avenue East, Toronto 12, on payment of a deposit of One Hundred Dollars ($100.00). Such deposit will be refunded upon the return, in good condition, of the said Documents and Plans to the Commissioner of Works.

Conditions relating to tendering as prescribed in the Contract Documents must be complied with. The lowest or any tender will not necessarily be accepted.

F. G. Gardnier, Q.C., Chairman.

W. W. Gardhouse
Metropolitan Clerk.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4928) will be received at Ephrata, Washington, until July 30, 1957, for furnishing labor and materials for Potholes East Canal Enlargement, Sta. 299+40 to Sta. 376+32 and Sta. 770+00 to Sta. 1157+02. Columbia Basin Project, Washington. Location near Othello, Washington. Principal items are 1,230,000 cu. yds. excavation; 106,000 cu. yds. compacted earth lining; 145,000 mile cu. yds. overhaul; 80 cu. yds. concrete in structures; 47 M.b.m. timber in bridges; and other work. Completion time 135 and 500 days. For particulars, address Bureau of Reclamation, P. O. Box 368, Ephrata, Washington; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

GOVT. OF DIST. OF COL., DEPT. OF HIGHWAYS, June 19, 1957. SEALED PROPOSALS will be recd. in Rm. 404, 499 Pa. Ave., N.W., Wash. 1, D. C., until 2 PM, July 17, 1957, EDT, and then publicly opened and read for constr. a Steel Girder Bridge carrying the Anacostia Freeway over E. Cap. St. (Bridge No. 84), Fed. Aid Proj. No. I-05-1(2), consist. of 39,000 cu. yds. backfill and fill; 9,850 cu. yds. excavation; 3,363 cu. yds. class "B-B" concrete; 500,000 lbs. reinf. steel; 30,000 lin. ft. treated timber piles in place; 360,000 lbs. structural carbon steel and 811,900 lbs. structural low-alloy steel. (Minimum wage rates for this project have been predetermined as required by law and are set forth in the bid proposal). Proposal forms, plans and specns. obtainable from Supervisor, Contr. & Bond Sec., Procurement Office, D. C., Rm. 406, 499 Penn. Ave., N.W., upon deposit of a certified check for $30.00 per set, payable to Collector of Taxes, D. C. (Tel. NA 8-6000, Ext. 2378).

EMPLOYMENT OPPORTUNITIES

REPLIES (Box No.): Address to office nearest you
c/o This publication Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

City Engineer: Registered professional engineer desired for City of approximately 18,000. Municipal experience desired, but not mandatory. Full details of education, experience and qualifications should be furnished. Contact Mayor, Fremont, Nebraska.

Civil Engineer with at least two years college training not over 35. Must have military training completed and interested in the building construction business, starting in the field. We offer opportunity for rapid advancement to ambitious, hard-working young men willing to accept responsibility. Starting salary $110.00 per week if unexperienced, with higher wages for those with some experience. Send complete history data. Martin K. Eby Construction Co., Inc., 610 N. Main, P.O. Box 1679, Wichita 5, Kansas.

Wanted: Graduate M.E. to supervise contractors shop, mechanics, field operation of equipment, purchasing; young man, broad experience preferred. N.Y. State area. Resume and salary requirement to P-5322, Engineering News-Record.

Civil Engineer, Experienced in Sewage Collection and Treatment, preliminary planning for housing projects and/or Roads and Streets. Will consider business interest, profit sharing, or, state minimum salary. Write: C. C. Jobe and Associates, P.O. Box 544, Merritt Island, Florida.

Engineer-Gunite, wanted immediately, must know estimating, take complete charge of all gunite operations. Executive position ultimately available. P-5355, Engineering News-Record.

Highway and Bridge Engineers, Designers, Draftsmen. Permanent positions. Well established and growing. (Location Southern Connecticut). Send resume of experience to: P-4969, Engineering News-Record.

Engineering graduates with experience in testing and control of concrete, asphalt and soils for permanent position in New England. Give full details of experience and education. State salary requirements. P-5295, Engineering News-Record.

Construction Man Wanted. Old well-known general construction and engineering firm operating in Central New York desires to negotiate mutually profitable agreement with a thoroughly qualified all-around construction man who is good at supervision, contracts, estimating, expediting etc. Must be around 35 years of age and a graduate civil engineer. P-5367, Engineering News-Record.

Sales Engineer—Precast Concrete Products. Sales to contractors, architects & engineers. New York City Area. Please include resume with first reply to, P-5382, Engineering News-Record.

Inspectors: For Asphalt Paving on large Turnpike Project in Eastern Connecticut. Permanent Position. Salary open. John J. Mozzochi and Associates, 265 Hebron Avenue, Glastonbury, Connecticut.

City Engineer—Street Superintendent, Arcata, Calif., (pop 4720) Calif. Registration Required, Municipal experience preferred but not mandatory, Salary open. Attractive, challenging position in college town, modern schools, equable climate, progressive community. Apply City Engineer, City Hall, Arcata, Calif. List qualifications.

Assistant City Engineer, Arcata, Calif., Graduate Civil Engineer, Apply City Engineer, City Hall, Arcata, Calif. List qualifications.

Wanted, experienced structural draftsman to supervise the work of six draftsmen, handle job correspondence, subcontracting of drawings, etc.; write stating qualifications and compensation desired. P-5393, Engineering News-Record.

Two Teachers, Mechanics, Applied Electricity, General Physics. One Head of Department, Ph.D. engineering preferred. B.S. or M.S. also considered. Salary and rank dependent on qualifications. Salary scale good. Room for advancement. Apply President, Montana School of Mines, Butte, Montana.

POSITIONS VACANT

Gunite Superintendent—Wanted immediately. Middle Atlantic States. State age, experience, availability, salary desired. P-4640, Engineering News-Record.

Construction Supt. Experienced in Penna. State Highway Construction. Must be capable of supervising project from start to completion. State age, experience, availability and salary desired. Sanctis Construction, Inc., 410 Marlow Street, Pittsburgh 20, Pa.

Railroad Representative-Structural Engineer with experience in B & B department for educational work with railroads. Age 30 to 40. Headquarters Chicago. Portland Cement Association, 33 West Grand Avenue, Chicago 10, Illinois.

Wanted—Assistant City Engineer eligible for future registration in Texas. City planning and Urban Renewal experience desirable. Good working conditions. Permanent with opportunity for advancement. Growing city of 35,000. Contact City Engineer, Harlingen, Texas.

Sales Engineer-Estimator for structural steel and miscellaneous iron fabricator. Degree in architectural or civil engineering desirable. State experience, education, age, salary requirements and enclose snapshot with first letter to Southern Iron Works, Inc., P. O. Box 430, Alexandria, Va.

Engineers wanted experienced in waterways construction to plan, coordinate, aid inspect this work. Construction, Mechanical, Electrical Engineers, and Engineering Aids experienced in surveying are also needed. Positions are in the Federal Civil Service. Starting salaries for engineers are $5335, $6115, and $7035 per annum. Engineering Aids begin at $3175, $4525 per annum. Included are automatic increases and other benefits. Apply to the Area Engineer, U. S. Army Engineer District Field Office, Pittsburgh Air Force Base, Plattsburgh, New York, or call Plattsburgh 3265.

Field Superintendent needed at once to supervise several small crews in back-of-the-paver operations involving joint sawing, sealing and concrete curing. Ability to effectively handle men absolutely essential. Exceptional earnings based upon profit sharing, and chance to enter aggressive young firm at permanent management level. Write giving complete background, experience, age and starting salary to: P-5448, Engineering News-Record.

Superintendent—$8,000.00 salary, plus percentage of profits. Permanent position with midwest contractor doing Sewerage and Water Treatment Plants and main work. State age, availability, experience, and references. Right man can go to work immediately. P-5447, Engineering News-Record.

POSITIONS WANTED

Construction or Project Manager, capable executive. 27 years experience from field superintendent to Foreign Resident Manager. All types multi-million dollar construction, foreign and domestic. Contract negotiations, estimating, purchasing, labor and public relations. Spanish, German, French Portuguese. Seeking a permanent assignment but would consider challenging term contract in Europe, Latin-America or USA. PW-5275, Engineering News-Record.

Registered Professional Engineer Executive, Extensive experience Construction, Maintenance, Design Management over $350,000. Industrial, Public Works, Structures, Utilities. Excellent references. PW-5265, Engineering News-Record.

C.E. Age 54. 32 yrs. exper. Reg. P.E. Desire work in small New England city. PW-5256, Engineering News-Record.

Superintendent, Bldg. Const. 25 years experience field supervision. Industrial, commercial, institutional, churches, etc. Similar field position desired. Can travel. PW-5332, Engineering News-Record.

Wanted job as Supt. or Project Manager. Have 25 years experience in heavy Const, Heavy Grading and General Const, am available in the near future. Please state your desires and expectation in your reply. PW-5307, Engineering News-Record.

(Continued on the following page)

EMPLOYMENT OPPORTUNITIES

DISPLAYED

The advertising rate is $31.80 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured 7/8" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

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$2.10 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.
Position Wanted ads take ½ of above rate.
Box Numbers—count as 1 line.
Discount of 10% if full payment is made in advance for 4 consecutive insertions.
Not subject to Agency Commission.

Send NEW ADS and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD
P. O. Box 12, N. Y. 36. July 11th issue closes June 28th

Unusual opportunity with substantial multi-corporation, well-equipped, Central Ohio Highway and Heavy Equipment Contractor doing multi-million dollar volume.

Must be aggressive, creative and cost minded,—thoroughly trained with successful experience in organization, administration, systems, procedures, tax planning and budget control as well as general ledger, equipment and construction cost accounting.

Compensation commensurate with demonstrated ability to execute above requirements.

Reply in own handwriting giving complete resume of education, experience and salary requirements, with photo. Present position will be protected.

Reply: **P-5439**, Engineering News-Record,
520 N. Michigan Ave., Chicago 11, Ill.

Immediate Openings for the following, experienced in heavy duty equipment repair and maintenance.

Heavy Duty Maintenance Supt.
Major Shop Repair Superintendent
Motor Transport Superintendent

Spanish Project, 18 months, must speak Spanish, salaries open. Send resume, including experience, education, age and salary requirements to:

CORBETTA - COVILES
1480 Edgewater Road, Bronx, N. Y.

SAN FRANCISCO

BECHTEL

SENIOR ENGINEERS AND DRAFTSMEN

CIVIL

Experienced in site development, storm drainage or water supply.

HYDRO

Recent work experience on concrete or earth dams; power houses or penstocks.

Liberal relocation allowances for you and your family.

Send Resume to:
Manager of Employment & Placement
Industrial Relations Division

Bechtel Corporation

220 Bush St., San Francisco 4, Calif.

Recruiting offices also in New York, Los Angeles and Houston

ENGINEERS

Foreign Employment

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Career opportunities for graduate engineers with minimum 6 years experience supervising maintenance engineering functions in oil refining or producing facilities, power plants, heavy industrial installations and supporting community facilities. For work in Saudi Arabia as Staff Engineers. Also opportunity for engineers with production control experience.

High salary plus living allowance and liberal all-inclusive benefits conducive to large savings. Excellent community facilities.

Write outlining background and experience. Please include telephone number.

Recruiting Supervisor, Box 215

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE
NEW YORK 22, NEW YORK

HIGHWAY ENGINEERS
DESIGNERS, DRAFTSMEN, SURVEYORS

Excellent opportunities for experienced men having ability to produce professional work on schedule. Employee benefits. Salaries commensurate with qualifications. Please send detailed educational and experience resume plus availability.

ROBERT W. LOWRY, INC.
227 Pine St. Harrisburg, Pa.

HIGHWAY ENGINEER

California Civil Engineering Registration or ability to secure registration required. Applicants must have from 5-10 years of supervisory and administrative experience in all phases of highway construction including design, material testing, specification writing and field engineering. Applicants must be capable of assuming full charge of surveying, design and construction of County Highways.

No written examination is required.
Starting salary $700.00 per month.

Ideal living conditions in small foothill city with Junior College, and easy access to city and Sierras.

State age, resume of experience and availability in first letter to Road Commissioner, County of Placer, Auburn, California.

POSITIONS WANTED

B.C.E. 1951. Experience on highway and airport construction. Seek position with general contractor or engineer. PW-5358, Engineering News-Record.

Civil Engineer, Registered, 29, now asst. to head of Bridge Dept. in consult. firm, cost-conscious & alert, seeks interesting & responsible pson., pref. large East Coast city. Exp. in prestressed concr. as well as steel desn. PW-5371, Engineering News-Record.

Construction Engineer—Experienced 25 years Management, bidding, supervising, purchasing and negotiating for successful general contractors on building and heavy construction. Available soon. Western location preferred. PW-5370, Engineering News-Record.

Project Manager, age 40, for commercial or industrial construction. Background with architects owners contractors will accept transfer. $14,000. Available July 30, 1957. PW-5416, Engineering News-Record.

Construction Engineer, Foreman, Supervisor —8 yrs experience in heavy construction, tunnels, bridge, river improvement, pipeline; have worked as project engr., job supt., foreman, office mgr., estimator. Presently employed as branch mgr. for small pipeline contractor. Graduate engr., 34, married, desire greater opportunity, US or foreign. PW-5430, Engineering News-Record.

Structural Engineer—Registered—27 years broad experience best references. Seeks position in Florida. PW-5425, Engineering News-Record.

Construction Superintendent, — Estimator, B.S., C.E. and Business Administration. 10 yrs. Chemical, Refinery, and Industrial Plants. Know all crafts. Desire long range opportunity with general or mechanical contractor. PW-5453, Engineering News-Record.

Structural Engineer, RPE, age 36, experienced in design and inspection of schools and industrial bldgs. Broad civil background. Desire responsible design with consultant or architect. PW-5451, Engineering News-Record.

Civil and Structural Engineer, M.S., 32, Danish, Fluent English, experienced in Prestressed Concrete, wishes to emigrate and work in U.S. PW-5283, Engineering News-Record.

PART-TIME WORK WANTED

A group of professors would like to get some extra work, preferably highway bridges, highways, reinforced concrete structures, mill buildings towers, etc. Reasonable rates. "Preliminary drawings in 48 hours", is our motto. PTWW-5250, Engineering News-Record.

STRUCTURAL
ENGINEERS
DESIGNERS
DRAFTSMEN

Prefer several years or more experience in any of these fields:

BRIDGES

BUILDINGS
EXPRESSWAYS
HYDRO PROJECTS
TEST FACILITIES*

Will consider lesser experience with good educational background, including several recent graduates to round out a planned expansion program. Occasional openings for combination field men. These are permanent additions to our regular staffs.

We are professional engineers engaged primarily in design which covers a wide scope of practice. The variety and unusual character—for example, the proposed world's largest bridge project—offer excellent opportunity for professional development and advancement.

Immediate openings in our St. Louis general offices and occasionally in our San Francisco branch office. Confidential interviews can also be obtained at Washington, D.C., and Portland, Oregon.

Paid vacation, sick leave, holiday, overtime. Excellent Employee Benefits Plan provides retirement income plus life and disability insurance. Blue Cross. Moving allowance.

Please write fully, including salary data, to

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915 Olive St. Louis 1, Mo.

*We are designers of the technical facilities for the Arnold Engineering Development Center, operated by our subsidiary, ARO, Inc.

SENIOR ENGINEER
HIGHWAY MAINTENANCE
FOREIGN EMPLOYMENT

Civil Engineer with extensive experience in roadway maintenance operations (including program administration) required to supervise country wide maintenance program in Near East. Liberal salary, transportation for family plus other attractive allowances and benefits. Send detailed personal history and experience record.

P-5406, Engineering News-Record, Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

MAINE
STATE HIGHWAY DEPARTMENT
NEEDS

Chainmen—Rodmen—Draftsmen—Instrumentmen
Inspectors—Engineering Assistants
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Openings for both high school graduates with experience and college graduates.

Salary Increases Recently Authorized by Legislature.

- Starting salaries based upon education and experience.
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- Hospitalization Plan.
- Retirement Plan.
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Work week—40 to 50 hours depending upon classification and desire to work. Salary based on length of work week.

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***For application form: Write to, or call on,* George L. Smith, Personnel Officer, State Highway Commission, Augusta, Maine.**
Tel. Mayfair 3-4511, Extension 489.

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ENGINEERS

• • • • •

Several attractive openings in New York offering a unique opportunity to join a highly respected company with excellent prospects for professional growth and personal achievement.

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Graduate E.E. with substantial background in layout, design, selection and application of lighting for utility power plants, industrial and office buildings. Capable of assuming complete responsibility for all technical problems related to lighting engineering.

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2-5 years experience in the engineering and design of steam electric stations and substations. Preparation of equipment and material specifications, supervision of preparation of design drawings, including control wiring diagrams.

Please send complete confidential resume to:

P-5435, Engineering News-Record
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

McKEE

has permanent openings for

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DRAFTSMEN

in the following categories:

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PIPING
MECHANICAL
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BROAD diversification of work in our three engineering divisions assures you security of employment.

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Arthur G. McKee & Company

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PHONE TOwer 1-2300
Engineering offices in
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CIVIL ENGINEERS
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ATTRACTIVE POSITIONS ARE AVAILABLE FOR QUALIFIED MEN WHO WILL ACCEPT RESPONSIBILITY AND WISH TO MAKE A CAREER IN DESIGN OF HIGHWAYS, EXPRESSWAYS AND ALLIED CIVIL ENGINEERING WORK. THERE IS AMPLE OPPORTUNITY FOR PROFESSIONAL ADVANCEMENT BASED UPON MERIT. SALARIES ARE REVIEWED AT REGULAR INTERVALS. PAID VACATIONS, SICK LEAVE AND MOVING ALLOWANCE. EXCELLENT RETIREMENT AND BENEFIT AND HOSPITALIZATION PLANS.

OVERSEAS OPENINGS FOR GRADUATE CIVIL ENGINEERS WITH SEVERAL YEARS HIGHWAY ENGINEERING EXPERIENCE.

WRITE FULLY TO

SVERDRUP & PARCEL ENGINEERING CO.
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Highway & Bridge Engineers
Designers & Draftsmen

Career opportunities for men interested in professional recognition.
Excellent working conditions and employee benefits including liberal retirement program.
Openings in Pennsylvania, Maryland, Florida, West Virginia, Mississippi and overseas.

Air Mail Resume TO R. L. SHAW, *Personnel Director*

MICHAEL BAKER, Jr., INC.

BAKER BLDG. *Consulting Engineers* ROCHESTER, PA.

OVERSEAS AIRBASE

CIVIL ENGINEERS

Degree or equivalent. Strong background AE work including field design & supervision, inspection & construction. All phases Civil & Structural on airbases or similar projects.

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Degree or equivalent. Strong background AE work including field design & supervision, inspection mechanical and POL installation, air base or similar.

CHIEF INSPECTORS & SR INSPECTORS

(Building—Mechanical—Electrical)
Heavy experience AE inspection or supervision. Degree or equivalent.

TECHNICIAN—ASST

(Soils & Materials)
Familiar Asphalt, Concrete & Soils testing. Assist in Lab & Field.

. . . Excellent base pay
. . . Guaranteed overtime
. . . Room & Board furnished

Send complete resume including past employment, salaries and references to

P-5346, Engineering News-Record,
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

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Long established firm of consulting engineers with world-wide practice needs both beginners and experienced civil, electrical, mechanical and foundation engineers for interesting work on large dams, powerplants, and river control works. Permanent positions. Liberal employee benefits. Starting salaries dependent on qualifications. Please send complete resume to Hugo Niemi, Personnel Manager.

HARZA ENGINEERING CO.
400 W. Madison St. Chicago 6, Ill.

BRIDGE & HIGHWAY ENGINEERS DRAFTSMEN

BROOKHART & TYO
Consulting Engineers
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	7-1-57
Junior Engineer (Civil)	$480-$550
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For Further Information and Applications, *inquire:*

San Francisco Civil Service Commission
154 City Hall
San Francisco, California

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Dirt . . . Paving . . . Bridges . . .

Long Established, Reputable New York State Thruway Contractor wants the best man available for project construction superintendent. Applicant must present complete record of past experience. Record must prove ability to assume full responsibilities for all types earth moving, concrete and asphalt paving, structures and heavy equipment. Work area principally but not confined to New York and adjacent states. Travel is required. Salary, future, etc., excellent for right man. Interviews granted only after study of record and references. Company requirement is high quality work performed profitably. What are your requirements.

P-5351, Engineering News-Record,
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

CORROSION ENGINEERS

Openings for young Electrical Engineers interested in training for corrosion engineering positions involving corrosion testing and solution of corrosion problems. Some field construction experience desirable on heavy construction such as steam or hydroelectric plants.

These are staff positions with a long-established engineering and construction company. Excellent opportunities for advancement in a new and expanding engineering field.

Please send complete confidential resume to:

P-5413, Engineering News-Record,
Class. Adv. Div., P.O. Box 12, N. Y. 36, N. Y.

HIGHWAY ENGINEER

Highway Engineer with 8 to 12 years experience in design and administration. Must be able to assume heavy responsibility. Excellent opportunity with established consulting engineering firm in Middle West. Must be registered.

P-4635, Engineering News-Record,
520 N. Michigan Ave., Chicago 11, Ill.

THREE POSITIONS AVAILABLE FALL QUARTER — 1957

INSTRUCTOR—CIVIL ENGINEERING—(1) (Male). Subjects to be taught: Engineering Drawing, Descriptive Geometry, Plane Surveying and Mechanics. **Requirements: Minimum:** B. S. Degree. **Salary:** Dependent upon education and experience.

ASSISTANT PROFESSOR: — CIVIL ENGINEERING — (2) (Male). Subjects to be taught: Dependent upon interest and experience. **Requirements:** Minimum B. S. Degree — preferred M. S. **Salary:** Dependent upon interest and experience.

To Whom Apply:
EARL D. DAKE, Head, Civil Engineering Dept.
and Vice-President
School of Mines and Technology
Rapid City, South Dakota

PROJECT ENGINEER

To take complete charge of organization & construction of large multi-storing apartment and motel development in Wilmington and Philadelphia area.

Must be experienced. Compensation commensurate with ability. Give complete details by letter only.

BUILDERS DEVELOPMENT & SERVICE CO.
701 Hardt Building, Broad & Columbia, Phila., Pa.

***When Answering* BOX NUMBERS . . .**

to expedite the handling of your correspondence and avoid confusion, please do not address a single reply to more than one individual box number. Be sure to address separate replies for each advertisement.

ASSISTANT TRAFFIC ENGINEER

For Traffic Engineering Department recently established. Salary range $622 to $691 a month with maximum salary obtainable through annual and longevity increases. Registration as a professional engineer required. No residence restrictions for U. S. citizens to begin work. Wisconsin Retirement Fund and Social Security Benefits.

PERSONNEL DEPARTMENT
404 City-County Bldg., Madison 9, Wis.

PROCESS CONTROL & QUALITY SUPERVISOR

Bituminous Road Materials

An unusual opportunity is available for a man, between 30-40 years of age, who wants maximum responsibility and advancement in a fast-moving expansion of bituminous mix plant facilities. Opening is in our New York home office.

Position entails process and quality development and control, also investigation of customer problems. Involves some travel to plants and field jobs.

Applicant must have thorough understanding of bituminous mix plant operations, raw materials, and finished product tests and specifications. College engineering education and/or equivalent practical experience. Salary commensurate with education and experience.

Please send resume to Personnel Department

BARRETT DIVISION
Allied Chemical & Dye Corp.
40 Rector St.—New York 6, N. Y.

ENGINEERING POSITIONS OPEN

Location—Mid-Illinois or Denver, Colorado

DESIGN ENGINEERS—4
SURVEY CHIEFS—2
INSTRUMENT MEN—2
***Salary:* $5540-$13,800**

Plus

1) Eligibility to profit sharing after 12 months
2) Vacation and sick leave
3) Allowance for moving

SEND:

1) Education
2) Experience
3) References
4) Salary Required

P-5403, Engineering News-Record,
520 N. Michigan Ave., Chicago 11, Ill.

WANTED
MECHANICAL ENGINEER

Minimum ten years experience including design of dredges and auxiliary equipment. Established contractor. Midwest location. Write full particulars.

P-5410, Engineering News-Record,
520 N. Michigan Ave., Chicago 11, Ill.

ASSISTANT CHIEF ENGINEER

C.E. experienced in structural steel detailing and design, checking and estimating to understudy for Chief Engineer with long established structural steel fabricator. Submit detailed resume and photograph.

C. E. MORRIS COMPANY
745 Curtis Avenue Columbus, Ohio

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There's Opportunity on Beautiful Gulf Coast

Immediate openings for:

CHIEF STRUCTURAL ENGINEER
New Orleans office—experienced in highway bridge design.

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New Orleans—preferably experienced in urban design.

STRUCTURAL ENGINEERS
DRAINAGE ENGINEERS
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DRAFTSMEN—HIGHWAY AND STRUCTURAL
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Company paid hospitalization, life insurance and retirement. 40-hour week. Air-conditioned offices. Liberal salaries. Permanent position. Excellent opportunities for advancement. Send complete resume of education and experience with salary requirement to:

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About 40—Experienced in water, gas, electric and telephone construction—A small contracting company needs man to handle expanding forces in New Jersey and New York. Kindly reply to:

P-5328, Engineering News-Record,
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

Chief mechanical engineer

CONSULTING ENGINEERING FIRM (Eastern seaboard) has immediate opening with a real challenge and a real future for an experienced engineer-administrator with a solid background in large units of power generation.

THE SUCCESSFUL CANDIDATE must have the technical knowledge, competency, leadership, and know-how to perform and execute the duties of engineering department head.

REPLY IN CONFIDENCE by complete resume including phone number and availability.

P-5350, Engineering News-Record
Class. Adv. Div.,
P. O. Box 12, N. Y. 31, N. Y.

SALES ENGINEERS

A major steel company has need for sales engineers to promote and sell fabricated products in middle Atlantic states. Excellent opportunities for men 25 to 30 years old with engineering background and a desire for sales work. Attractive starting salary with company car, expenses and bonus plan.

SW-4684, Engineering News-Record,
Class. Adv. Div., P.O. Box 12, N. Y. 36, N. Y.

MECHANICAL PROJECT ENGINEERS

Ebasco, a long established name in power plant engineering design and construction, has need for Mechanical Project Engineers.

IF YOU—have an engineering degree plus 7-10 years experience in the engineering design or construction of public utility power plants . . .

Can handle people and have the ability and well-rounded background to assume full responsibilty for a project from inception till ready for operation . . .

THEN WE—can offer you an attractive salary, and a New York location with all its vocational, educational and cultural advantages . . .

And can offer you an excellent chance for advancement in the engineering and construction field.

There are also several positions offering a similar potential for graduate engineers with 3-5 years experience in engineering design and construction of public utility power plants as JOB ENGINEERS.

Write fully and
in complete confidence to
Mr. W. W. Patterson
Employment Manager

EBASCO
SERVICES INCORPORATED

Ebasco Building
2 Rector St. New York 6, N. Y.

CONSTRUCTION ENGINEERS

Foreign Employment

Career opportunity for graduate engineers in Saudi Arabia. Degree essential. Minimum 10 years experience supervising construction of industrial buildings, oil processing and oil handling facilities. To supervise actual construction by contract or service organization personnel involving control over construction methods, scheduling, expediting and progress; utilization of men and materials; and the inspection of workmanship for compliance with plans and specifications.

Salary commensurate with experience plus living allowance and generous all-inclusive benefits. Excellent community facilities.

Write outlining background and experience. Please include your telephone number.

Recruiting Supervisor, Box 214

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE
NEW YORK 22, NEW YORK

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TRUCK CRANES: Lorain T20 complete with crane boom, shovel front and backhoe.

DRAGLINES P & H model 955, 2½ yd., 90 ft. boom.

Bucyrus Erie 7-W, 140 ft. boom, 8 cu. yd. bucket, 2200/3810 volts, 3 phase, 60 cycle.

BRIDGES: Deck Girder Type—2 Girders each, 44 ft., 54 ft., 65 ft. and 75 ft.

CLAMSHELL BUCKET: Williams 1¼ yd. capacity, excellent condition.

LOCOMOTIVES: 1—G. E. Diesel Electric 25 ton, standard gauge, new 1956. 2—5 ton, standard gauge, with geared Caterpillar power units.

MOTOR: G. E. 50 H. P., 2200 volts, 3 phase, 60 cycle, 450 RPM, with control equipment.

CAR PULLER: Stephens Adamson continuous wire rope Car Puller, 20 H. P. 440 volt, heavy duty type.

BELT CONVEYORS: 60" x 170 ft. and 60" x 300 ft., complete.

MINE HOISTS: Double clutched drums, 10' dia., 10' face, 1⅜" rope, 1000 FPM, one 600 H. P., one 1250 H. P., with all electrics, 2200 volt, 3 phase, 60 cycle.

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Capacities to 70 Tons
Booms to 140 ft. and 30 ft. jibs
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CONSTRUCTION CONSULTANTS
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NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

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Design, Drafting & Detailing. Bridges and all types of buildings. Structural, Mechanical, Electrical. Professional Engineers. WW-5325, Engineering News-Record.

Structural Steel Detailing. Est. N.Y.C. firm seeks contracts. Exp. in all types of structures (Ind., Comm., Public, Misc.) and specialized in bridges. WW-5450, Engineering News-Record.

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OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Forty third year
Study solely without obligation
WILSON *Engineering Corp.*
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For MANITOWOC Model 3000 & 3500
GUARANTEED REBUILT

ANDERSON EQUIPMENT COMPANY
P.O. Box 1737, Pittsburgh 30, Pa.
Phone: LEhigh 1-6020

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1—Transport Trailer—50 Ton Capacity—Used less than 800 miles—Sacrifice for quick sale.

Charter Oak Construction Co. Inc.
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FREE!

A complete list of used construction equipment at each of State's branches. Write Jake D. Croft for free copy at:

STATE Equip. Cos.
3725 N. Front St., Harrisburg Pa.

ATTENTION PILE DRIVERS

FOR SALE OR RENT
20K Syntron Diesel Hammer 50C Vulcan Hammers

FOR RENT
#1 Vulcan Hammers — 30C Vulcan Hammers

EQUIPMENT & SUPPLIES, INC.
540 Delwar Road — Pgh. Pa. TU 4-0700

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HOPPER-DREDGE
16" HYDRAULIC-DREDGE
20" HYDRAULIC-DREDGE
12" DREDGE-PUMP
300 H.P.-ELECTRIC-MOTOR SLOW SPEED

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BUCKEYE 120 DITCHER

11'6" Maximum Digging Depth, complete equipment for digging 18" to 36" width; 15' conveyor for 7'9" dumping height, Chrysler powered. Machine used approximately 300 hours: Condition Excellent. Original Cost $19,000.00 in 1955. Selling price $13,500.00 F.O.B. Cincinnati, Ohio

CONSTRUCTION EQUIPMENT CORPORATION
5235 Madison Road — Cincinnati 27, Ohio

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2—REX 3 Yd. Horizontal Moto-Mixers
PRICE EACH $750.00

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FOR SALE

One Johnson 70 cu. yd., 105 Ton, three compartment aggregate bin, with three yard batcher complete with scale. Price $4,300.00 at Exeter, Pa.

JOS. FUTCH CONSTRUCTION CO., INC.
220 TRAYOR ST. — EXETER, PA.
Phone: Wyoming 727

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REDUCTION GEAR

1—Used 1900 RPM Input 24 RPM Output 200 HP Reduction Gear with or without built in thrust bearing for hydraulic dredge cutter drive. Call Purchasing Agent

DIAMOND MANUFACTURING COMPANY
Savannah, Georgia — Phone ADams 6-2451

FOR SALE

10 5½ yd. Mixers

B. TURECAMO CONTRACTING CO., Inc.
Belt Parkway at 24th Ave., Brooklyn 14, N. Y.

Wanted to Rent or Purchase

8 Foot Finished Circular Tunnel Form

30 foot length minimum, 240° arch. Sidewall type in 5 or 10 ft panels, adaptable for use on curve.

W-5337, Engineering News-Record,
520 N. Michigan Ave., Chicago 11, Ill.

FOR SALE OR RENT

CRANES

1—35-40 ton Industrial Brownhoist Model #8, Serial #11083 with Caterpillar D-13000 diesel engine. 70' boom with 5' fixed jib. Excellent condition.

1—Model 820 Lorain, Serial #18221, 90' boom, cap. 2 yds., 6-cyl. D-13000 Caterpillar diesel engine. Thoroughly rebuilt.

1—Industrial Brownhoist Locomotive Crane, Model L, Steam, with oil-fired boiler, 110' boom, serial #5049. 40-50 ton cap. Priced for quick sale.

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1—Austin Western 5-8 ton variable weight, diesel powered, hydraulic steering. Thoroughly rebuilt.

1—Buffalo-Springfield 8-ton, gas. powered, mechanical steering. Good operating condition.

TRENCHERS

1—Buckeye Mdl. 12, diesel powered. Max. digging width 24", depth 5½'. Thoroughly rebuilt.

1—Buckeye Mdl. 12, gasoline powered. Max. digging width 24", depth 5½'. Thoroughly rebuilt.

LOCOMOTIVES

4—8-ton Standard Gauge: 3 Brookville, 1 Plymouth.

2—10-ton Plymouth Standard Gauge Diesel Model BFA.

GENERATOR

1--100 KW Ideal AC, 127/220/230/400/440 volt, 3 ph. 50 or 60 cycle, with Hercules DNX diesel engine, skid mounted. Weight 16,170#.

PILE DRIVING EQUIPMENT

2—#1 Vulcan Hammers with standard base.

5—#2 Vulcan Hammers: 2 with McDermid base; 3 with standard base McKiernan-Terry Hammers: 9B3, 9B2, 7, 6, 5, 3 and 1.

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MANITOWOC LIFTCRANE

MODEL 3000B AND 3500

FORSYTHE EQUIPMENT CO., INC.
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HIGH LIFT

INTERNATIONAL TD14
With HOUGH Front End Shovel. Engine Rebuilt. Tracks Rebuilt. Serial No. TDF-28868T2. A REAL BARGAIN
PRICE $5,500.00
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Phone: LEhigh 1-6020

FOR SALE OR RENT
New Model 3—100 American Steel Erectors
Guy Derrick—100' Boom, 110' Mast,
complete without running cable and hoist.
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FOR SALE

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Macks Diesel 10 wheeler dump trucks, 10 yds and over. Hiel body. Excellent condition for export. 7 trucks—1956—1949.

FS-5277, Engineering News-Record, Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

Equipment for Sale

★ 4500 Manitowoc combination shovel and dragline. 120' dragline boom. 38'6" shovel boom. 27' sticks with 3½ cu. yd. heavy duty manganese bucket. Caterpillar D-397 supercharged diesel engine. New 1950. Price $120,000.00. Available approximately July 20, 1957. Located Massena, New York.

★ 4500 Manitowoc with Hi-lift shovel front, 5 cu. yd. dipper, D-397 Caterpillar diesel engine. New 1951. Price $120,000.00. Located Atlanta, Georgia.

★ 3500 Manitowoc with 2½ cu. yd. dipper. Cummins NHIS diesel engine and torque converter. Roller bearing main drums. New 1956 used very little. Price $65,000.00. Located Ogdensburg, New York.

★ D-397 Caterpillar Drop-in unit suitable for reinstallation in 4500 Manitowoc. Approximately 1,000 hrs. New November 1956. Price in application. Located Ogdensburg, New York.

★ 80-D Northwest 2½ cu. yd. shovel. Murphy ME6 diesel engine. Price $30,000.00. Located Massena, New York.

★ 2—Northwest Model 80-D 2½ cu. yd. dipper shovels only. Murphy 21 diesels. New 1956. Located 100 miles east of Stockton, California. Price $55,000.00 and $52,500.00 present location.

★ 24—28 cu. yd. Euclid 34 ton rear dump trucks. Tandem axle. Five Model 1-FFD with twin G.M.C. 6-71 diesel engines, five Model 4-FFD with twin Cummins NHB engines. All have Allison 500 series convertors. Price $28,000.00 each. Discount for purchase of five or over. 6 located Ogdensburg, New York, 4 located Fresno, California.

★ 1—8TD 22 ton Euclid rear dump truck. Price $10,000.00. Located Ogdensburg, New York.

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★ 150 ton capacity Johnson dry batch plant with model TY-400 4 compartment aggregate, 1 cement bin, distributor, elevator, charging conveyor, 11' welded silos. 876 and 829 bbls capacity. 10' x 10' aggregate receiving hopper. 2 yd. TY-162 Concentric batcher. Undertrack cement screw conveyor. Located Allston (Boston), Mass. Price on application.

All items offered subject to inspection and prior disposition. Our new Equipment for Sale bulletin is available on request. For further details contact,

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ZIM T. PEARCE, Equipment Sales Manager

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DIESEL ELECTRIC LOCOMOTIVES

STANDARD GAUGE

25 - 35 - 40 - 50 - 65 - 75 - 100 tons

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Slightly Used
80D Northwest Double Stick Shovel Attachment

Excellent Condition

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BIG VALUES IN USED CATERPILLAR TRACTOR-SCRAPERS

Two—Caterpillar DW-21 Diesel Tractors with #21 Scrapers. Both units have new D-337 Series F turbo-charged engines and are excellent as to operating condition and appearance.
F.O.B. cars, Cincinnati, Ohio, each.....$27,000.00

One—Caterpillar DW-21 Diesel Tractor, Series C, with #470 Lowbowl Scraper. Has operated only 552 hours in rental service. Condition like new.
F.O.B. cars, Cincinnati, Ohio.....$39,955.00

Two—Caterpillar DW-21 Diesel Tractors, Series C, with #470 Lowbowl Scrapers. Very low hours, available from our rental fleet.
F.O.B. cars, Cincinnati, Ohio.....On request

One—Caterpillar DW-10 Diesel Tractor, S/N 1V1707, used 1526 hours, with #21 cable control and current Model #15 Scraper. Excellent condition and appearance.
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Write—wire or phone for other used machinery not listed. All equipment Subject to Prior Sale. 8x10 Glossy Photo Furnished Upon Request.

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6S WORTHINGTON-RANSOME
With Power Loader, Water Tank, 4-Cylinder Gasoline Engine, 2 Pneumatic Tired Trailer, End Dump. GUARANTEED REBUILT .....PRICE $750.00
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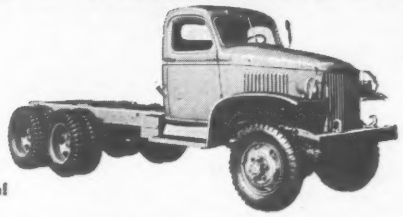

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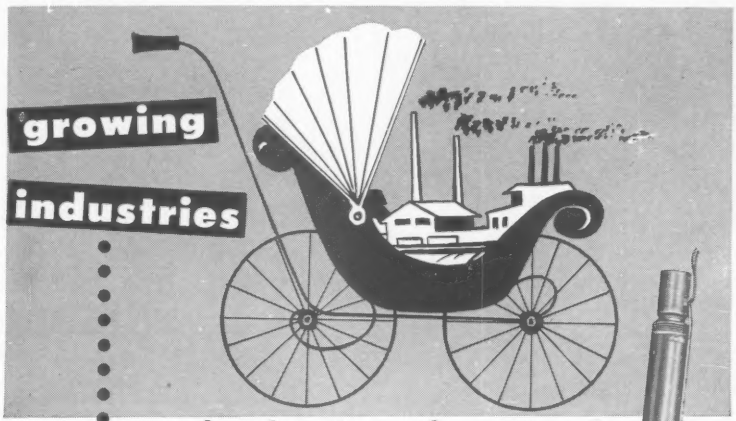

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THE DEATH of President Harry S. Rogers of Brooklyn Polytechnic Institute has removed from the world of technical education one of its most effective leaders, and at a time when his special talents will be sorely missed. The growing need for larger numbers of technically trained young people, fitted both by basic knowledge and psychological attitude to serve modern science and industry, is a major problem of our times. On numerous occasions, Harry Rogers showed that he had an insight into paths that would lead to its solution, and time and again he provided the leadership in directions that proved profitable.

Twice he was elected president of the American Society for Engineering Education in whose councils he was a leading force in fitting curricula and teaching methods to the needs of a growing profession. One of the organizers of Engineers' Council for Professional Development, he foresaw the vital role such a body could play in upgrading engineering teaching, in selecting and guiding prospective students and in developing training programs for them during their first five years following graduation.

This is the kind of forward thinking that will soon be needed again as the studies of the profession and its future, now being planned by the American Society of Civil Engineers and jointly by Engineers' Council for Professional Development and Engineers' Joint Council, get under way.

In continually assuming responsibility and exerting leadership, Harry Rogers set an example that can and should inspire others engaged in the high calling of engineering education. His full and satisfying life and the honors he received should also encourage young engineers to think more seriously of engineering education as a career.

Thirteen years of teaching civil engineering subjects, as instructor, assistant professor and professor, preceded Harry Rogers' move to the managerial level as dean, and six more years elapsed until he received the appointment as president of Brooklyn Poly. Thus, in his case, as in that of other successful educators, a long period of apprenticeship, training and experience was the necessary prelude to high position and influence.

The career of Harry Rogers also contained lessons for engineers outside academic halls. It is often said that engineers, too frequently for their own good and the good of the profession, avoid extracurricular activities in public affairs. College-president Rogers found time also to be president of the Brooklyn Chamber of Commerce, the Rotary Club and the Downtown Brooklyn Association. He chairmanned drives for hospitals and the Red Cross, and he found time to lend counsel to several business firms who invited him to become a member of their boards of directors.

First and foremost, Harry Rogers was a great engineering educator. But he was also an engineering leader, and an active participant in public affairs. In all of these roles he set examples worthy of emulation and meriting lasting honor.

Summer Trip Suggestion

NOW IS THE TIME to visit the St. Lawrence Seaway and Power Project. As the Ontario Hydro's project director, Gordon Mitchell, told visiting engineers at the end of ASCE's inspection tour earlier this month (ENR June 13, p. 25), "You can see the pattern now. You see the results of 2½ years of work, with not much more than a year to go to produce power." At place after place touched by their bus caravan, the ASCE excursionists were told, "Next year we'll be under water at this point", or, "Ships will be passing right through here in 1958."

Those engaged in the strenuous race to complete this international, multi-agency, dual-purpose masterpiece of construction are on the far turn, approaching the home stretch. And according to Mr. Mitchell: "We think we can meet our schedule—right on the button." It has been a hard race for the constructors, and it's not over yet. But the greatest hurdles have been cleared.

There may never again be such a job as this—of such magnitude, so crucially scheduled and so delicately coordinated. That should have been amply clear to those who saw the job for the first time on this trip. For they must certainly have realized—as they looked at the boulder-strewn streambed that was the Long Sault, at the well-ordered chaos that will be the powerhouse, and at the deeply gouged farmlands where ships will pass—what great difficulties have been surmounted.

They stood on a 60-cell cofferdam to see the international powerhouse—now with roughly 600,000 cu yd of concrete in place on each side of the border—on which two contractors of separate nations are working using different means to accomplish the same end.

They saw the first concrete in stage two of the project's Long Sault Spillway Dam, placed not a week before against an exciting backdrop of the entire St. Lawrence rushing through the stage-one portion of the structure.

They saw Eisenhower Lock at 55% completion and Grass River Lock comparably well along. They saw Iroquois Control Dam, at the upper end of the future 25 mile power pool, well into its second stage—85% completed overall and headed for a November finish. And at its north end, they saw Iroquois Lock as a virtually completed structure nearly ready now for its gates.

They saw, also, great areas of cleared reservoir site, extensive channel modification work, dike building, house moving and canal dredging.

They saw what well may be—and only for this one more summer can remain—the greatest construction show on earth. Don't miss it!

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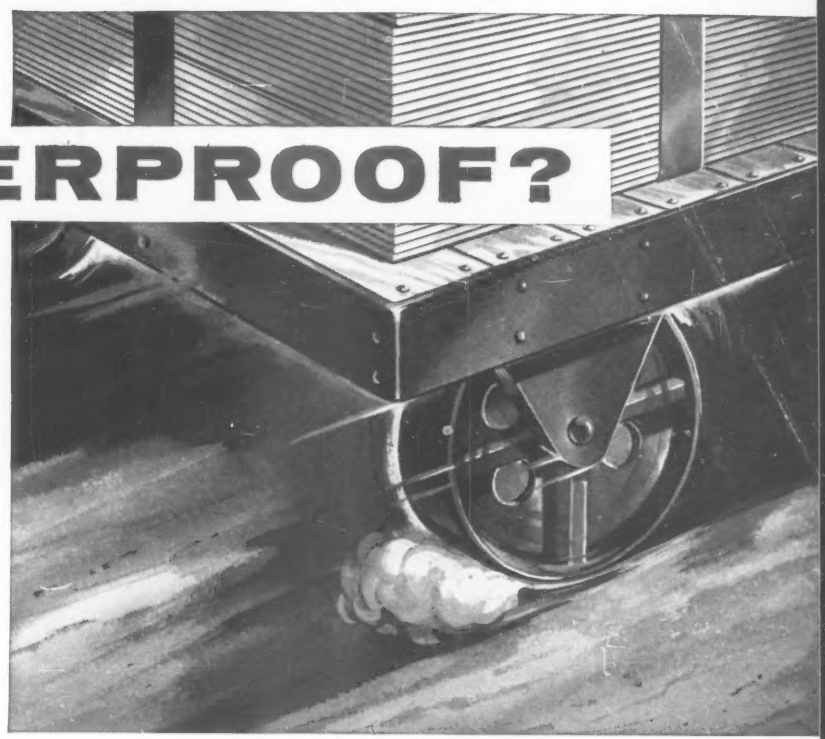


No concrete floor surface provides an absolutely true plane. Even minor irregularities intensify impact, causing a continual hammering action.

Floors made with hard aggregate are not necessarily long life. The surface of concrete, even with traprock, granite and emery, is brittle. Impact from truck wheels, pallets, skids and falling objects can shatter a brittle surface and produce ravelling—the start of costly floor maintenance.

Masterplate floors are tough. The scientifically graded iron particles of the Masterplate surface are ductile, cushion impact, prevent ravelling and provide the highest wear resistance*.

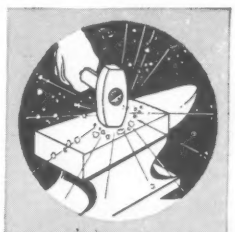
Many million square feet of Masterplate floors are in use today and giving excellent service. In addition to their great wear resistance, Masterplate floors are virtually non-absorbent and resistant to oil and many corrosives found in industry.

Full information on Masterplate and "see-for-yourself" demonstration kit on request.

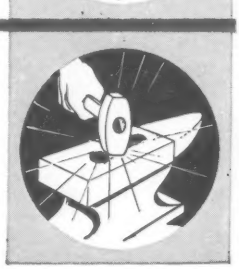
*In U. S. National Bureau of Standards Tests the Masterplate type floor had 6 times greater resistance to wear than the best plain concrete floor. In other tests, Masterplate floors have similar improvement in wear resistance over hard aggregate floors.

BASIC PRINCIPLE OF MASTERPLATE

Even the hardest non-metallic aggregates used for producing a plain concrete floor surface are brittle. Being brittle, they fracture under the impact of traffic and break out of the surface. Pitting and rutting follow.



Iron is ductile or malleable. That is why a *thick* "iron-clad" Masterplate concrete floor surface withstands the impact and abrasion of industrial traffic.



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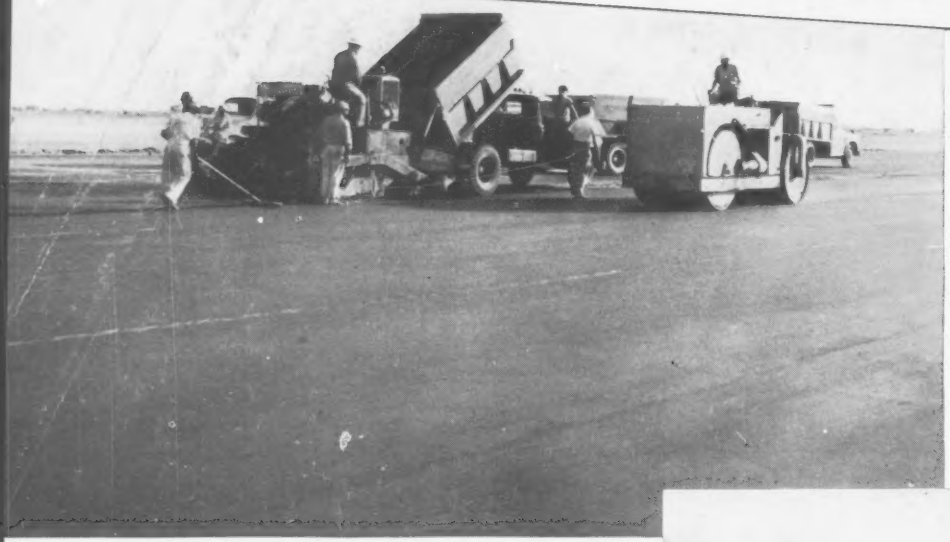
Answer to a paving problem

at Houston International Airport

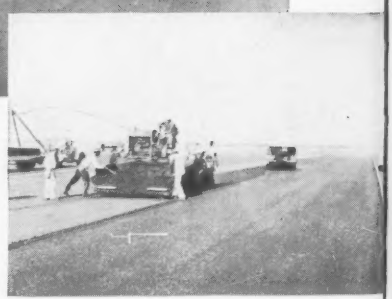


Photographs

(left) Laying initial course of 1-in Texaco Sheet Asphalt on instrum runway of Houston Internatio Airport.

(center) Rubber-tired and tand rollers were used to compact Sh Asphalt course.

(bottom) Constructing 3-in coarse-graded Texaco Asphal Concrete binder course.



One of the nation's busiest air fields, Houston International Airport was confronted with the deterioration of 155,000 square yards of rigid type pavement on runways and taxiways. How to provide this large area with durable, economical paving, while subjecting plane traffic to a minimum of inconvenience, was the problem.

The answer was the construction of a heavy-duty plant-mixed Texaco Asphalt pavement in three courses over the defective runways and taxiways. Approximately 50,000 tons of asphalt mix was laid to a thickness of 5¼ inches. One inch of fine aggregate Texaco Sheet Asphalt was laid first, partially filling cracks and leveling the old pavement. This was followed by 3 inches of coarse-graded Texaco Asphaltic Concrete and a 1¼ inch wearing surface of dense-graded Texaco Asphaltic Concrete.

Houston International Airport's Texaco-paved runways and taxiways combine rugged durability under heaviest air field traffic with a high degree of skid-resistance. Both initial cost and upkeep cost are lower than for comparable rigid paving. Snow melts more rapidly on a dark asphalt surface, an important advantage in many parts of the country.

Whether you are paving an airport, highway, street or parking area, there is a heavy-duty, intermediate or low-cost type of Asphalt construction to fit your requirements. Helpful information on all types is supplied in two free Texaco booklets which our nearest office will be glad to send you.

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